DOCUMENT RESUME

ED 177 736 EA 012 242

AUTHOR	Price, Gary G.; And Others
TITLE	Overview of School and Unit Variables and Their Structural Relations in Phase I of the IGE Evaluation.
INSTITUTION	Wisconsin Univ., Madison. Research and Development Center for Individualized Schooling.
SPONS AGENCY	National Inst. of Education (DHEW), Washington, D.C.
REPORT NO	WRDCIS-TR-475
PUB DATE	Dec 78
GRANT	OB-NIE-G-78-0217
NOTE	78p.; Report from the Project on Evaluation of Practices in Individualized Schooling
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	Elementary Education; Grade 2; Grade 5; *Individualized Instruction; Job Satisfaction; Mathematics Instruction; *Models; *Program Evaluation; Reading Instruction; *Research Methodology; School Organization; Teacher Morale; Teaching Methods
IDENTIFIERS	*Individually Guided Education

ABSTRACT

This document provides an overview of the school variables and unit variables used in Phase 1 of the Individually Guided Education (IGE) evaluation. Included in the discussion of each variable are a verbal definition of the variable, a description of the distribution of the variable in the 156 schools that participated in the Phase 1 study, and the internal consistency of the variable. Also included is a discussion of a structural model that was developed as an expression of how the school characteristics measured by these variables are supposed to influence each other in an IGE school. (Author)

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Technical Report No. 475

OVERVIEW OF SCHOOL AND UNIT VARIABLES AND THEIR STRUCTURAL RELATIONS IN PHASE I OF THE IGE EVALUATION

by

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Report from the Project on
Evaluation of Practices in Individualized Schooling

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Madison, Wisconsin

December 1978

EA 012 242

Published by the Wisconsin Research and Development Center for Individualized Schooling. The project presented or reported herein was performed pursuant to a grant from the National Institute of Education, Department of Health, Education, and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the National Institute of Education, and no official endorsement by the National Institute of Education should be inferred.

Center Grant No. OB-NIE-G-78-0217

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- developing and demonstrating improved instructional strategies, processes, and materials for students, teachers, and school administrators
- providing assistance to educators which helps transfer the outcomes of research and development to improved practice in local schools and teacher education institutions

The Wisconsin Research and Development Center is supported with funds from the National Institute of Education and the University of Wisconsin.

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Abstract

This document provides an overview of the variables used in Phase I of the evaluation of IGE. Included in the discussion of each variable are a verbal definition of the variable, a description of the distribution of the variable in the 156 schools that participated in the Phase I study, and the internal consistency of the variable. Also included is a discussion of a structural model, which was developed as an expression of how the school characteristics measured by these variables are supposed to influence each other in an IGE school.

This document provides an overview of the school variables and unit variables used in Phase I of the Individually Guided Education (IGE) evaluation. The school variables represent features of IGE schools, treating entire schools as the units of analysis. Unit variables represent features of specific Instruction and Research (I&R) units within schools. In both cases, the variables represent features that are supposed, by the IGE literature, to influence pupil and staff outcomes. Measures of pupil and staff outcomes are discussed in other reports.

The purpose of Phase I, as with the other phases of the IGE evaluation, is to gain a more comprehensive view of the system's operation and effectiveness. The basic objective of the IGE evaluation is to identify features of IGE schooling that contribute to the success of instruction, especially in reading and mathematics. The identification of such features is critical in making an evaluation of IGE as an educational system; it is also integral to an understanding of schooling in general.

Certain features of IGE schooling have a reputation as keys to the program's success. Phase I examines the extent to which these presumably essential features have been implemented among IGE schools, and assesses the effectiveness of that implementation. As a large initial study (including approximately 155 IGE schools), Phase I provides basic information about IGE schooling. It is intended to provide a functional understanding of IGE features, processes, and outcomes by relating a broad scope of variables in an interpretive

manner. The specific purposes of Phase I are:

1. to determine the degree to which the seven components of IGE have been implemented in IGE schools.

2. to describe and examine the relationship between the implementation of IGE components and means of instruction, particularly in reading and mathematics.

3. to describe and examine the relationship between the implementation of IGE components and staff outcomes.

4. to describe and examine the relationship--presumably by way of the means of instruction--between the implementation of IGE components and pupil outcomes. This includes such outcomes as reading and mathematics achievement, selected cognitive skills, and aspects of personality development.

The means of instruction and the outcome variables of this study are, without question, influenced by multiple, simultaneous causes that resist easy description. Since causal relationships are easier to study in isolation, most research has examined only one or a few of these relationships. Simple comparisons between IGE as an undifferentiated package and other educational alternatives provide us with little information about specific features and processes that occur in IGE schools. Therefore, Phase I simultaneously examines relationships among the network of variables believed to influence means of instruction, staff outcomes, and pupil outcomes--thereby advancing our understanding of each IGE feature and the network as a whole.

Phase I of the IGE evaluation is not a direct comparison between IGE schools and other schools; rather, it is an assessment of certain

fundamental and empirically testable premises on which IGE is based. Generally, there are three kinds of premises, which are listed below:

1. Certain organizational features make it more likely that certain desirable instructional practices will occur. These organizational features also make it more likely that the staff will be satisfied with their jobs.

2. The use of certain curriculum materials and associated systems of information collection and record keeping makes it more likely that certain desirable instructional practices will occur.

3. Those instructional practices which are deemed desirable in IGE make high student achievement more likely. They also make it more likely that desirable changes in other student characteristics, such as self-perception and locus of control, will occur.

The Phase I study evaluates premises of the kind listed above by assessing the relationships implied by those premises. This approach to evaluation would not be feasible if the IGE schools had uniformly implemented the organizational features, curriculum features, and instructional practices suggested by experts in IGE. Such uniformity, however, does not exist, as is apparent from the distributions of variables. Phase III of the IGE evaluation provides corroborating evidence that schools designated as IGE schools are not uniform. In Phase III, marked variability was found even among schools reputed to be exemplary IGE schools. Professors Popkewitz, Tabachnick, and Wehlage are currently preparing this report.

The variables used in the Phase I study are given verbal definitions in the next two sections of this report. For the purposes of this

study, the fundamental premises listed above have been represented as a network of postulated causal links among the variables of the study. Figure 1 presents in diagram form the various causal links that are implicit in the premises of IGE. This structural model shows the paths of influence which are assumed to underlie relations between content area achievement (math and reading achievement) and the other variables studied. Figure 1, which is known variously as a structural diagram, path diagram, or causal model, follows certain graphic conventions. According to these conventions, a straight, unidirectional arrow signifies that the variable at its base directly influences the variable at its tip. The omission of an arrow constitutes an explicit theoretical statement that no direct causal relationship exists. A variable is an indirect cause of a dependent variable if a path through two or more arrows can be traced from the dependent variable back to the first variable. Associated with each straight arrow is a nonzero value. The sign of the value denotes whether an increase in the causal variable produces an increase (plus) or a decrease (minus) in the dependent variable. A curved, bidirectional arrow is used between variables at the left of the figure which are known to be correlated, but for reasons that are not covered in the scope of the model.

The structural models presented in Figures 1 and 2 express how IGE as a system is believed to operate. Corresponding to the structural model is a system of structural equations. These equations may be statistically examined for their agreement with the data collected in the Phase I study. Within the limits imposed by the group-administered

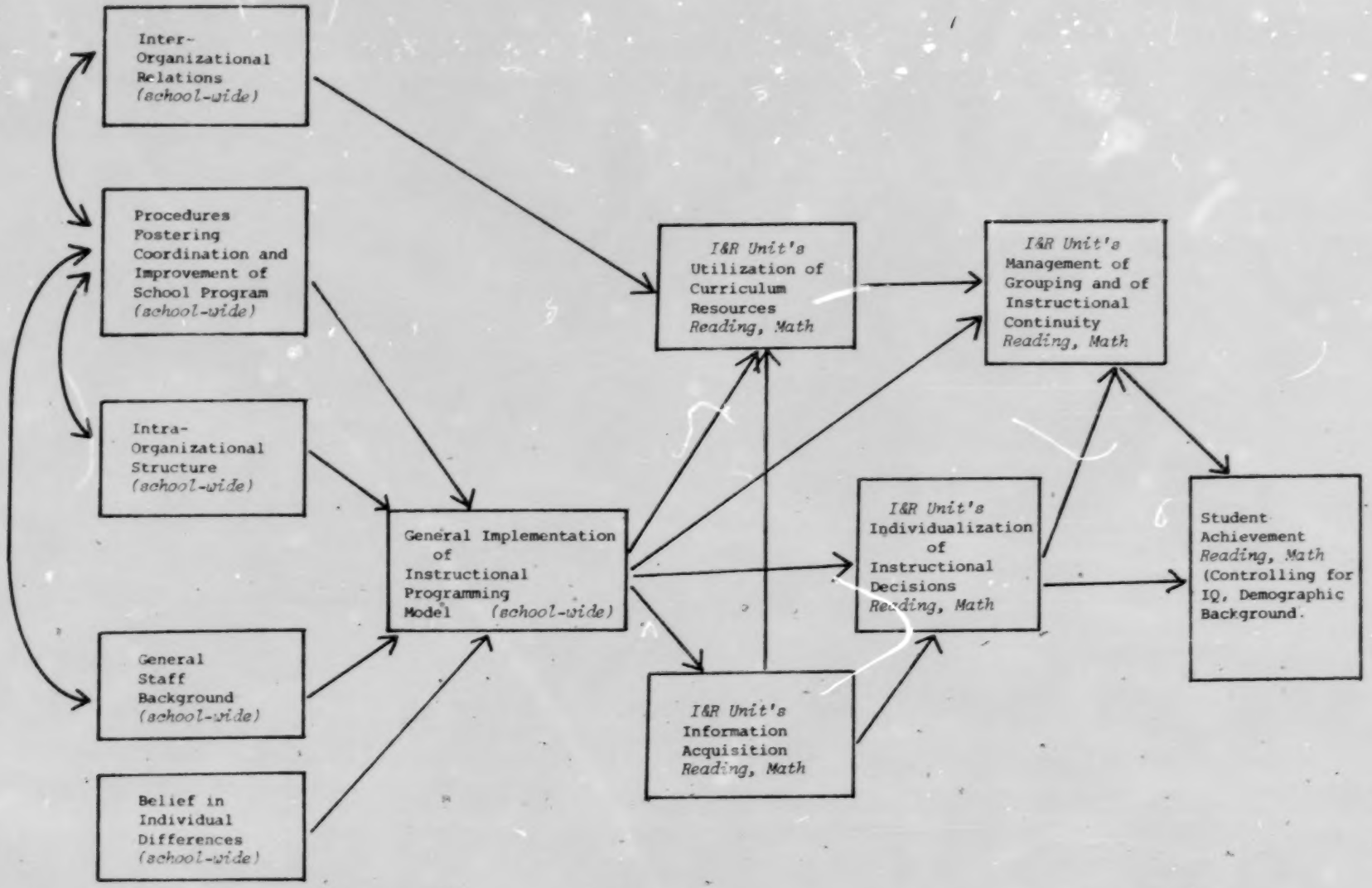
Inter-Organizational Relations (school-wide)
Procedures Fostering Coordination and Improvement of School Program (school-wide)
Intra-Organizational Structure (school-wide)
General Staff Background (school-wide)
Belief in Individual Differences (school-wide)
General Implementation of Instructional Programming Model (school-wide)
I&R Unit's Utilization of Curriculum Resources Reading, Math
I&R Unit's Information Acquisition Reading, Math
I&R Unit's Individualization of Instructional Decisions Reading, Math
I&R Unit's Management of Grouping and of Instructional Continuity Reading, Math
Student Achievement Reading, Math (Controlling for IQ, Demographic Background.

Figure 1. Phase I structural model predicting student achievement.

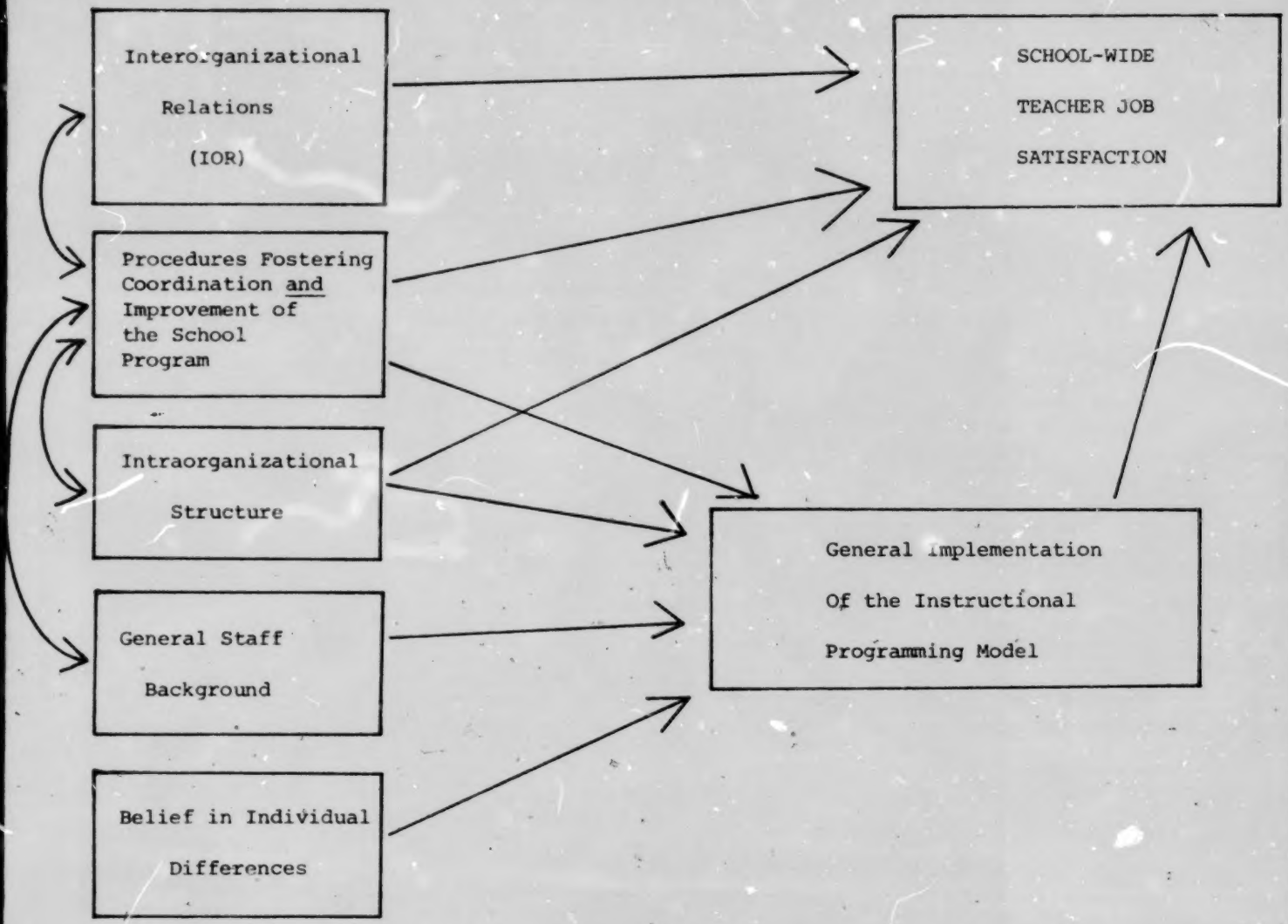

Figure 2. Phase I structural model predicting teacher job satisfaction.

standardized tests and previously developed questionnaires used to collect the data, this approach provides a test of the theoretical model that underlies IGE. If the relations between variables are not consistent with Figures 1 and 2, then probable inaccuracies in the underlying IGE model will be revealed. On the positive side, this approach can indicate important features and processes which deserve more attention from schools implementing IGE.

Description of Variables

Seven of the variables used in this study measure aspects of the school as a whole, such as organizational features of the school, school-wide practices, staff background, and demography of the school. Other variables do not pertain to the school as a whole; they are measures of a specific I&R unit's practices in Reading and in Math. Each variable specific to an I&R unit is actually treated as four separate variables. It is measured in two I&R units per school--one that includes children of grade 2 age and one that includes children of grade 5 age. In each I&R unit, there is a Reading version and a Math version of the variable. The school-wide variables are described first. Variables specific to the I&R unit are described thereafter.

School-wide Variables

There are six variables that describe general characteristics of schools and their staffs. A seventh variable, School's Demographic Setting (DB--standing for demographic background), describes the community and student population served by a school. Three of the school-wide variables, Interorganizational Relations (IOR),

Intraorganizational Structure (IOS), and Procedures Fostering Coordination and Improvement of the School Program (GOS), are measures of organizational features. These organizational features are supposed to foster staff job satisfaction and effective instructional practices. Two other variables, General Staff Background (GSB) and Belief in Individual Differences (INDIV), are measures of teachers' preparation, experience, and beliefs. These characteristics should also be related to job satisfaction and the use of effective instructional practices. Our structural model makes no formal attempt to enumerate underlying factors that influence differences among schools on the five variables mentioned thus far. For the purposes of the Phase I study, differences among schools on these variables are taken as given. Accordingly, Figures 1 and 2 show no straight arrows pointing toward these five variables. In the technical vocabulary of structural equations methods, such variables are called exogenous variables.

A sixth general school-wide variable is School-wide Implementation of the Instructional Programming Model (SIPM). Differences among schools on this variable are thought to be affected by four of the exogenous variables (namely, GOS, IOS, GSB, and INDIV). From the point of view of IGE implementers, IGE's distinctive organizational structures, school-wide procedures, and interorganizational relations are meant to facilitate implementation of the Instructional Programming Model (IPM). SIPM is not an exogenous variable, because our model enumerates reputed causes of its variations. Variables whose determinants are enumerated by a model, like SIPM, are referred to as endogenous variables.

The seventh variable, DB, is a measure of the demographic setting of the school as mentioned earlier. It is not supposed to be related to the other school-wide variables, nor should it be related to general aspects of instructional practices in the I&R unit. DB has been included because of its well-known correlation with student achievement. It is not included specifically in the structural model, but may be used as a control variable or covariate in the analysis.

In the following paragraphs, each of these school-wide variables is given a verbal definition. A description of each variable's distribution and internal consistency is also given. Readers wanting to know more about a specific variable should refer to the detailed technical report which corresponds to that variable. Table 1 lists technical reports and the variables with which they correspond.

Interorganizational Relations (IOR). IOR is a measure of the school's relationships and activities with outside persons and organizations, especially relationships and activities believed to facilitate implementing and maintaining IGE in the school. IOR includes extraorganizational arrangements and activities of the school and its staff members that keep the school informed of community needs and new educational ideas.

Summary statistics for IOR based on the 156 schools of the Phase I sample are: mean = 20.486; SD = 6.809; median = 20.228; actual minimum = 6.286; logically possible minimum = 0; actual maximum = 39.812; and logically possible maximum = 42. A histogram of the distribution of IOR is included in Figure 3. The internal consistencies (Cronbach's α) of IOR and its constituents are presented in Table 2.

Table 1

Technical Reports Describing School Variables Used in Phase I Study

School-wide Variable	Technical Report No.[a]
Interorganizational Relations (IOR)	476
Procedures Fostering Coordination and Improvement of the School Program (GOS)	477
General Staff Background (GSB)	478
Intraorganizational Structure (IOS)	479
Belief in Individual Differences (INDIV)	480
School's Demographic Setting (DB)	482
School-wide Implementation of the Instructional Programming Model (SIPM)	483

[a]Madison, Wisconsin: Wisconsin Research and Development Center for Individualized Schooling, 1978.

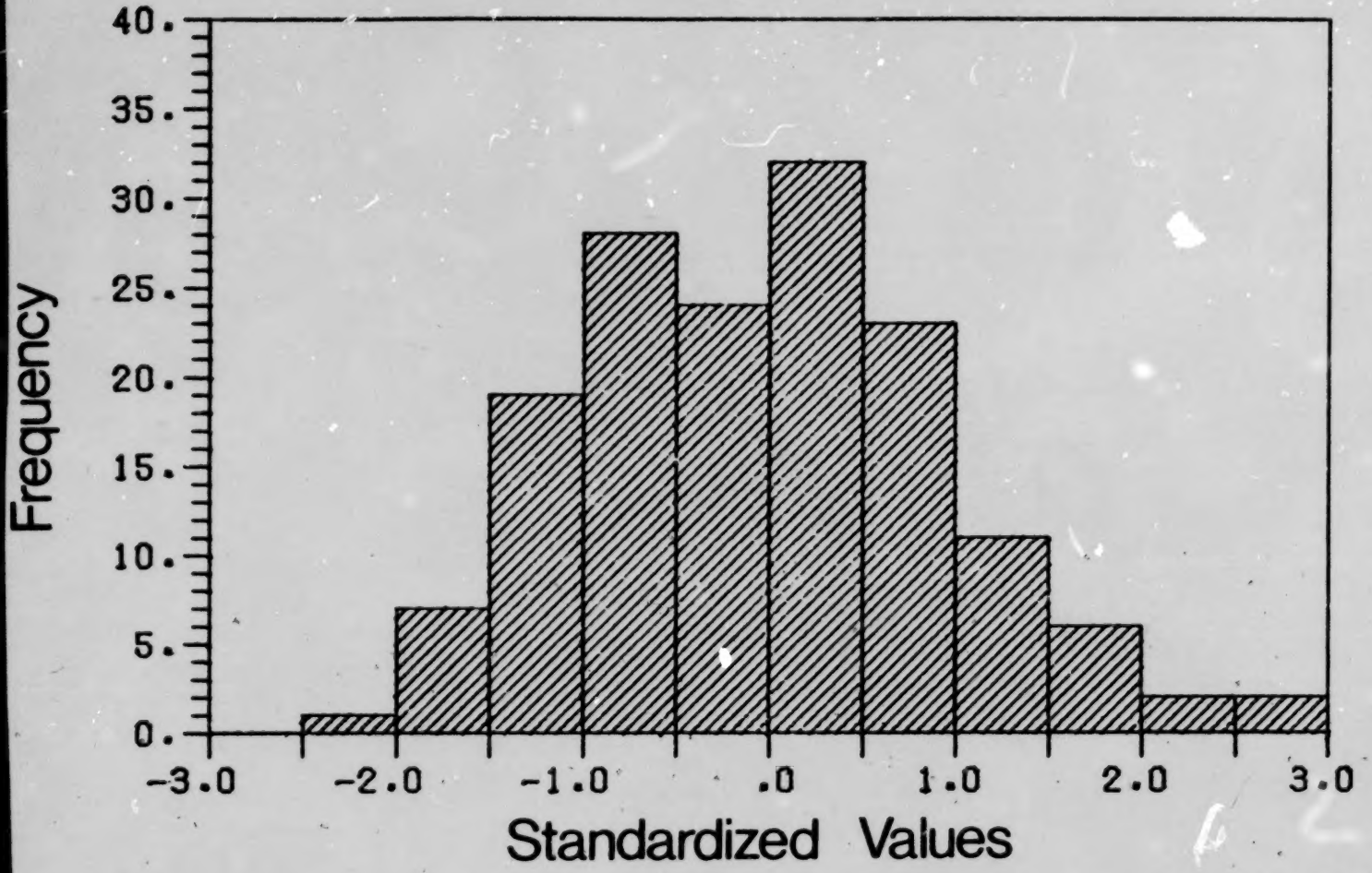

Figure 3. Interorganizational relations.

Table 2

Internal Consistencies of the Interorganizational Relations Measure (IOR) and Its Constituents

	Variable	α
Composite:	Interorganizational Relations (IOR)	.64062
Constituents:	System-wide Program Committee (SPC)	.73779
	IGE Network	.65826
	Community Relations	.81347

The relation of internal consistency to reliability is such that a composite whose constituents have high internal consistency may or may not possess high test-retest reliability. Conversely, a composite that has high test-retest reliability may have low internal consistency. Any composite that measures a homogeneous construct should be expected to have high internal consistency. However, a composite that measures a construct combining several empirically unrelated facets would not necessarily have high internal consistency, as noted by Cronbach and Meehl (1955). Several of the composites used in this study fit the latter description, and, accordingly, should not be expected to have high internal consistency.

Intraorganizational Structure (IOS). IOS is a measure of certain aspects of the school's internal organization that are relevant to implementing IGE. Organizational structures within the school (Instructional Improvement Committee, Instruction & Research units, etc.) are assessed for characteristics such as membership composition, frequency of meetings, permanence of leadership, amount of release time made available for meetings, whether parents and others participate in the activities of such groups, whether agenda of meetings are kept, and how agenda are distributed. The existence and responsibilities of certain supplementary staff positions (IMC directors, student teachers, aides, and interns) are also assessed as part of the internal organization of the school.

Summary statistics for Intraorganizational Structure (IOS) based on the 156 schools are: mean = 20.522; SD = 3.802; median = 21.223; actual minimum = 8.092; logically possible minimum = 0; actual maximum

= 26.415; and logically possible maximum = 33.3. A histogram for IOS is included in Figure 4. Table 3 provides the internal consistencies (Cronbach's α's) for IOS and its constituents.

Procedures Fostering Coordination and Improvement of the School Program (GOS). GOS is a measure of procedures in the school that are supposed to foster continuing improvement of the overall school program. Included are research and development, staff development, use of volunteers and aides, noninstructional (advisory) contact between teachers and students, and other aspects of home-school-community relations. We regret that the abbreviated name of this measure, GOS, has little mnemonic value. "GOS" stems from an earlier name by which we knew this variable--retained for the benefit of readers who will go on to read Technical Report 477, where "GOS" appears in many computing statements.

Summary statistics for GOS in the sample of 156 schools are: mean = 58.178; SD = 9.908; median = 57.934; minimum = 27.083; logically possible minimum = 0; maximum = 83.682; and logically possible maximum = 104. A histogram for GOS is included in Figure 5. The internal consistencies (Cronbach's α's) of GOS and its constituents are given in Table 4.

General Staff Background (GSB). GSB is a measure of teaching experience in IGE, teaching experience in general, and leadership activities in the profession.

Summary statistics of the 156 schools for General Staff Background (GSB) are: mean = 3.8444; SD = .618; median = 3.896; actual minimum = 1.884; logically possible minimum = 0; actual maximum = 5.021; and logically possible maximum = 7.0. A histogram for GSB is included in

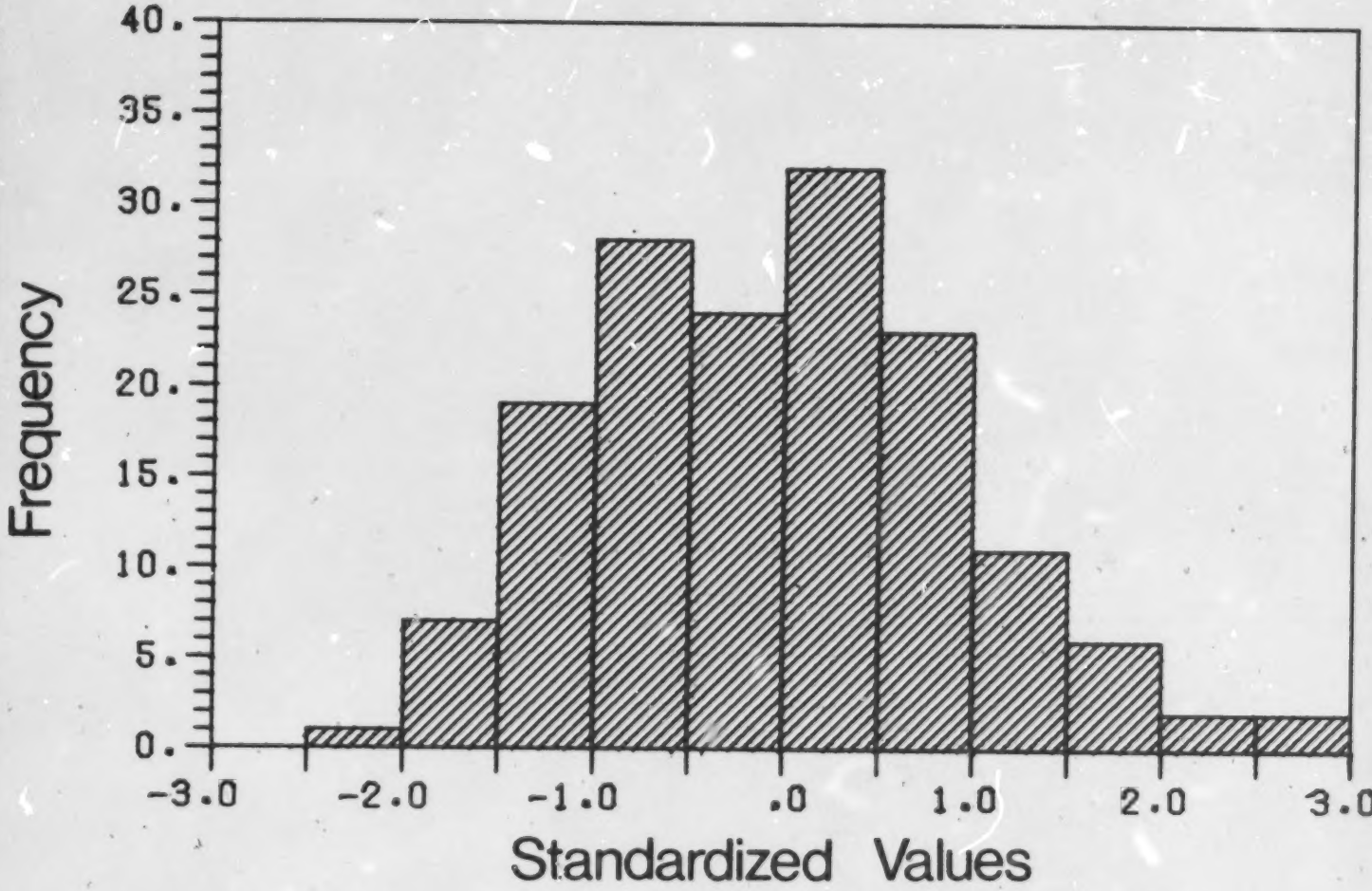

Figure 4. A histogram for IOS.

Table 3

Internal Consistencies for IOS and Its Constituents

	Variable	α
Composite:	Intraorganizational Structure (IOS)	.63479
Constituents:	Membership Component	.18649
	I&R Unit Functioning	.52115
	IIC Functioning	.54609

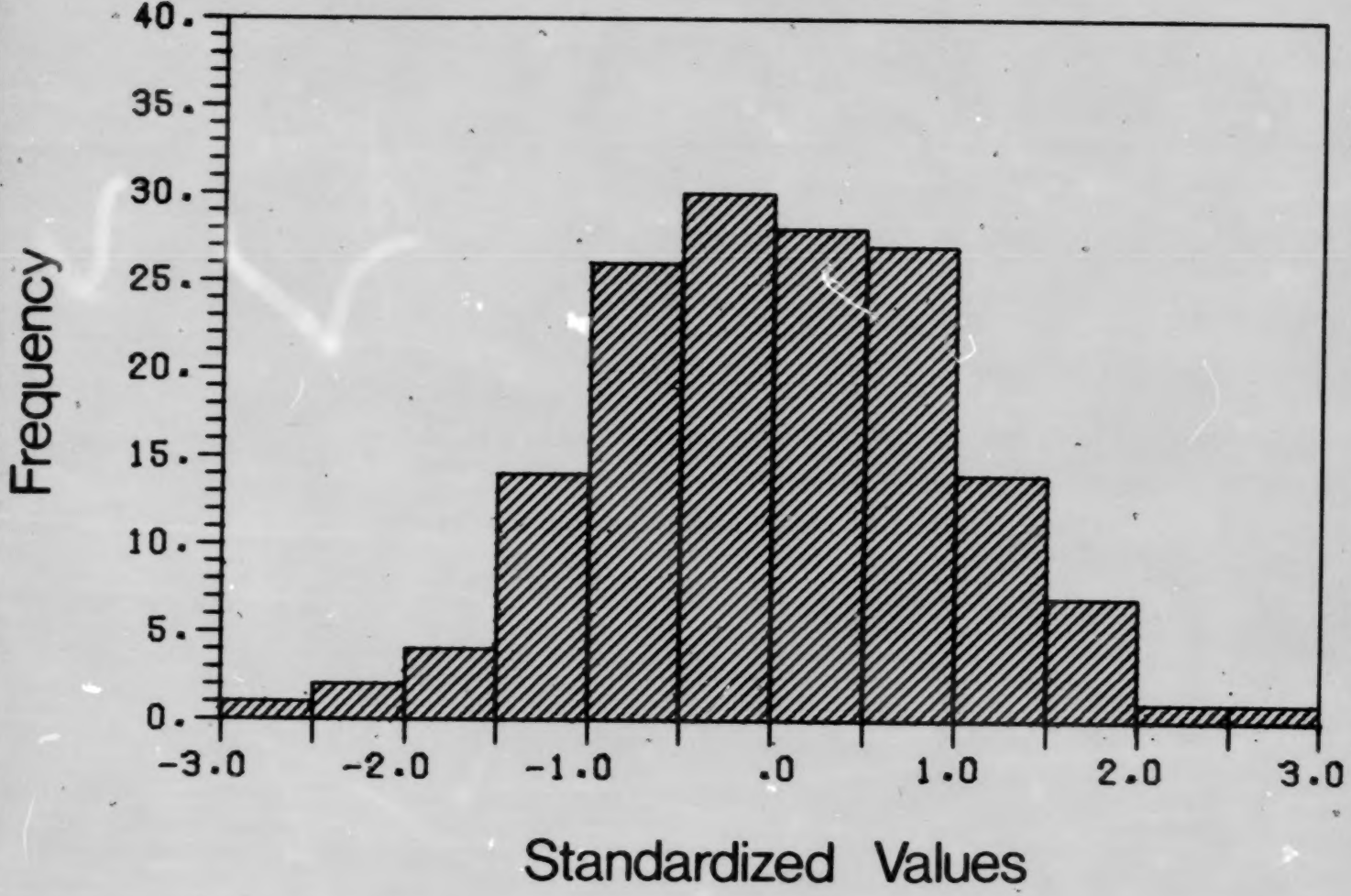

Figure 5. Procedures fostering coordination and improvement of the school program.

Table 4

Internal Consistencies of GOS and Its Constituents

	Variable	α
Composite:	Procedures Fostering Coordination and Improvement of the School Program (GOS)	.66673
Constituents:	Home-School-Community Relations	.31836
	Facilitative Environment	.21349
	Research and Development	.92114

Figure 6. The internal consistencies (Cronbach's α) of GSB and its constituents are given in Table 5.

Belief in Individual Differences (INDIV). INDIV is a measure of teachers' belief that students have individual needs which should be considered in planning and implementing an instructional program.

Summary statistics for Belief in Individual Differences in the sample of 156 schools are: mean = 3.163; SD = .179; median = 3.152; actual minimum = 2.556; logically possible minimum = 0; actual maximum = 3.667; and logically possible maximum = 4.0. A histogram for INDIV is included in Figure 7. The internal consistency (Cronbach's α) of INDIV is .872.

General, School-wide Implementation of the Instructional Programming Model (SIPM). SIPM is a measure of implementation of general school practices that have been encouraged by the Wisconsin R&D Center as supportive of the Instructional Programming Model (IPM). SIPM is based on self-reported practices of: (a) setting school-wide instructional objectives by the Instructional Improvement Committee (IIC); (b) adapting school-wide objectives in Instruction & Research (I&R) units; (c) using IIC guidance in the development of record-keeping procedures; and (d) providing for carrying out the IPM in the I&R units of the school.

Summary statistics for SIPM, based on the 156 schools in the sample, are: mean = 62.441; SD = 12.263; median = 64.061; actual minimum = 16.578; logically possible minimum = 0; actual maximum = 93.446; and logically possible maximum = 100. A histogram of SIPM is included in Figure 8. The internal consistencies of SIPM and its constituents are

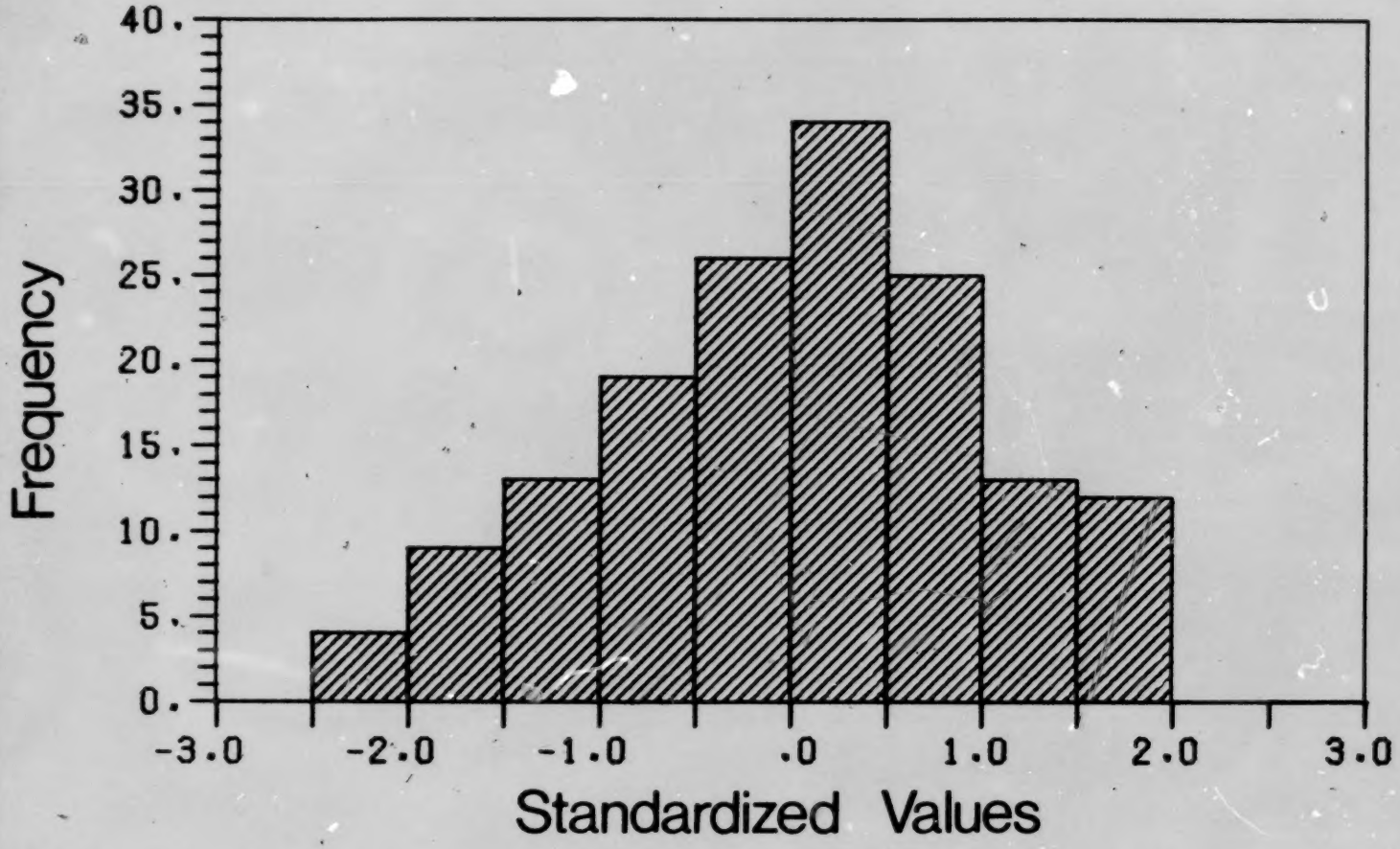

Figure 6. General staff background.

Table 5

Internal Consistencies for the GSB and Its Constituents

	Variable	α
Composite:	General Staff Background (GSB)	.26305
Constituents:	IGE Teaching Experience	.65645
	IGE Training Experience	--[a]

[a]This is a one-item constituent; therefore, the internal consistency cannot be calculated.

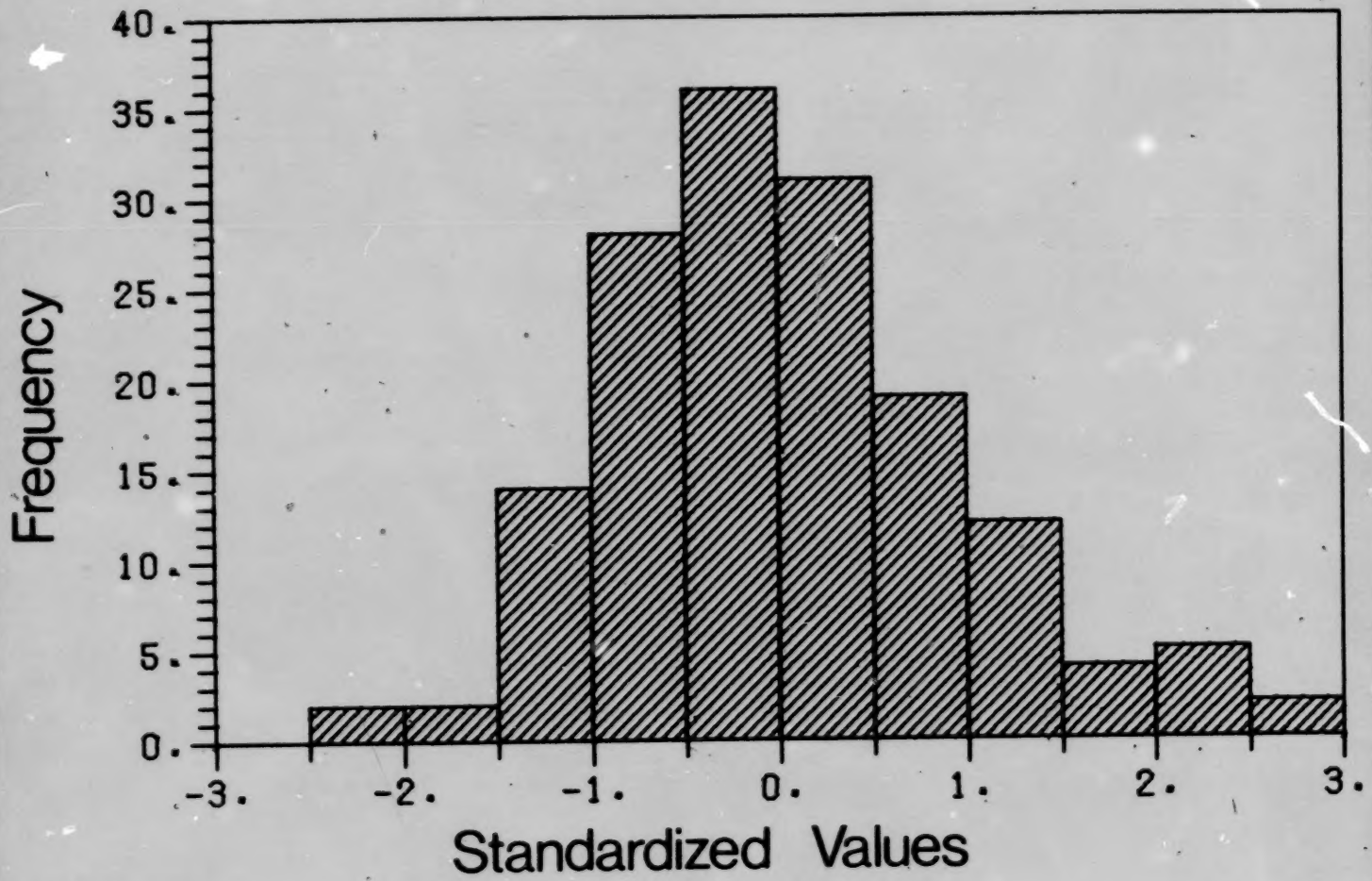

Figure 7. Belief in individual differences.

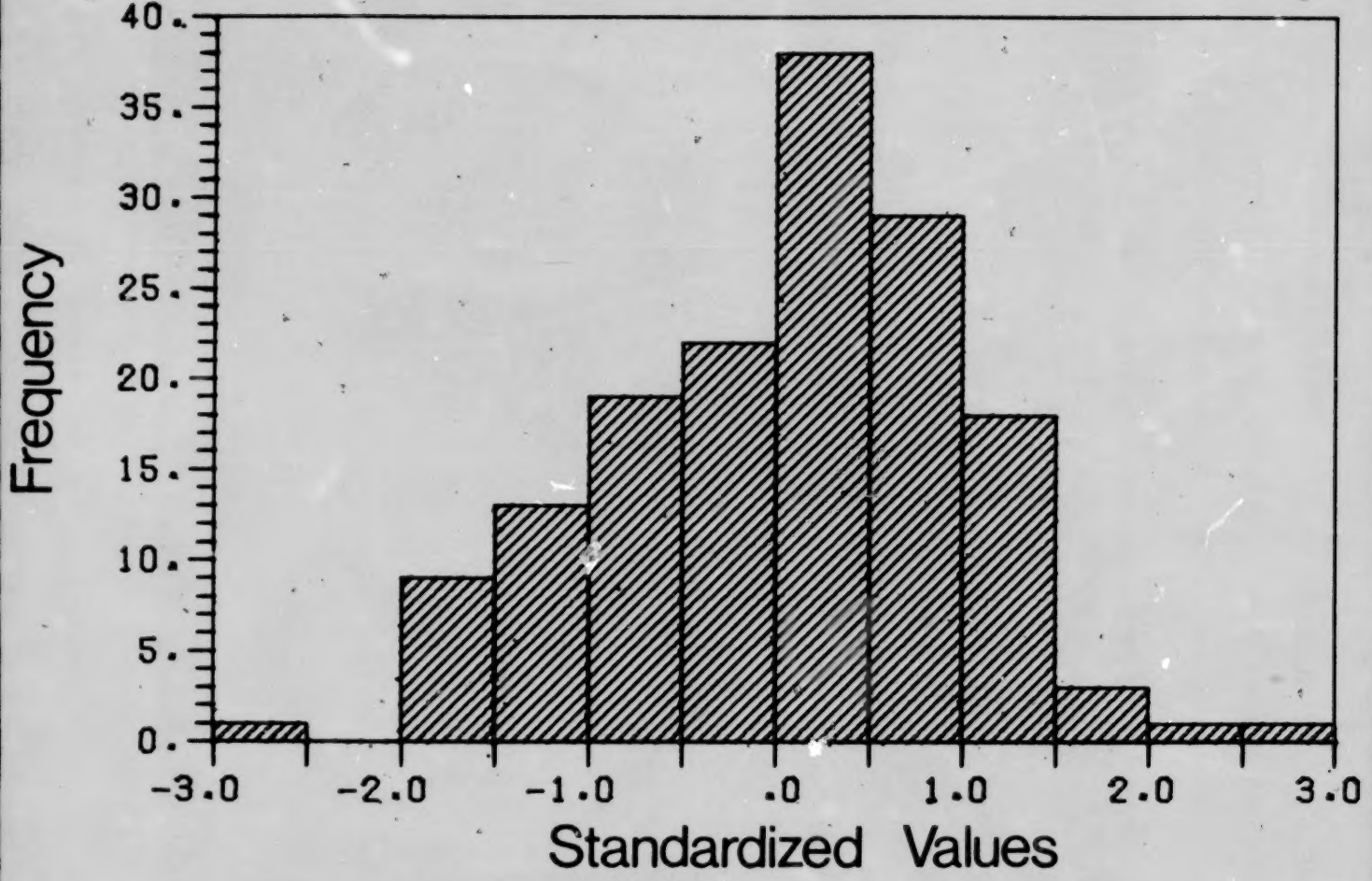

Figure 8. General school-wide implementation of the Instructional Programming Model.

presented in Table 6.

School's Demographic Setting (DB). DB is an ordinal demographic classification of the community served by a school. As such, it is a proxy for experiences, skills, and attitudes that students acquire outside the school, but which affect outcomes of interest to educators. This measure classifies the community of a school into one of the seven demographic categories employed in the National Assessment of Educational Progress; the categories are arranged in order of the rank they had on student achievement in the National Assessment.

Summary statistics for DB in the sample of 156 schools are: mean = 4.096, SD = 1.502, median = 4.225, actual minimum = 1, logically possible minimum = 1, actual maximum = 7.0, and logically possible maximum = 7.0. A histogram for DB is included in Figure 9. Since DB is not a composite of multiple items, its internal consistency cannot be calculated.

Measures of I&R Units' Practices in Reading and in Math

There are four variables that measure aspects of instruction in a specific I&R unit, rather than in the school as a whole. These variables are Utilization of Curriculum Resources (UCR), Information Acquisition (IA), Individualization of Instructional Decisions (IDM), and Management of Grouping and Instructional Continuity (IE). The practices of an I&R unit can differ from one curriculum area to another. Consequently, these variables have been measured separately in two curriculum areas, reading and math, which are the areas for which measures of student achievement have been obtained in this study. These four variables are intended to measure processes that are closer to what

Table 6

Internal Consistencies of SIPM and Its Constituents

	Variable	α
Composite:	General, School-wide Implementation of the IPM (SIPM)	.87
Constituents:	IIC Instructional Aide	--[a]
	Collecting Objectives	.39
	Record Keeping	.79
	Assigning Objectives	.31
	Specific Instruction	.76
	Assessment	.74
	Summative Evaluation	.51
	Miscellaneous IPM	.17

[a]This is a one-item constituent; therefore, the internal consistency cannot be calculated.

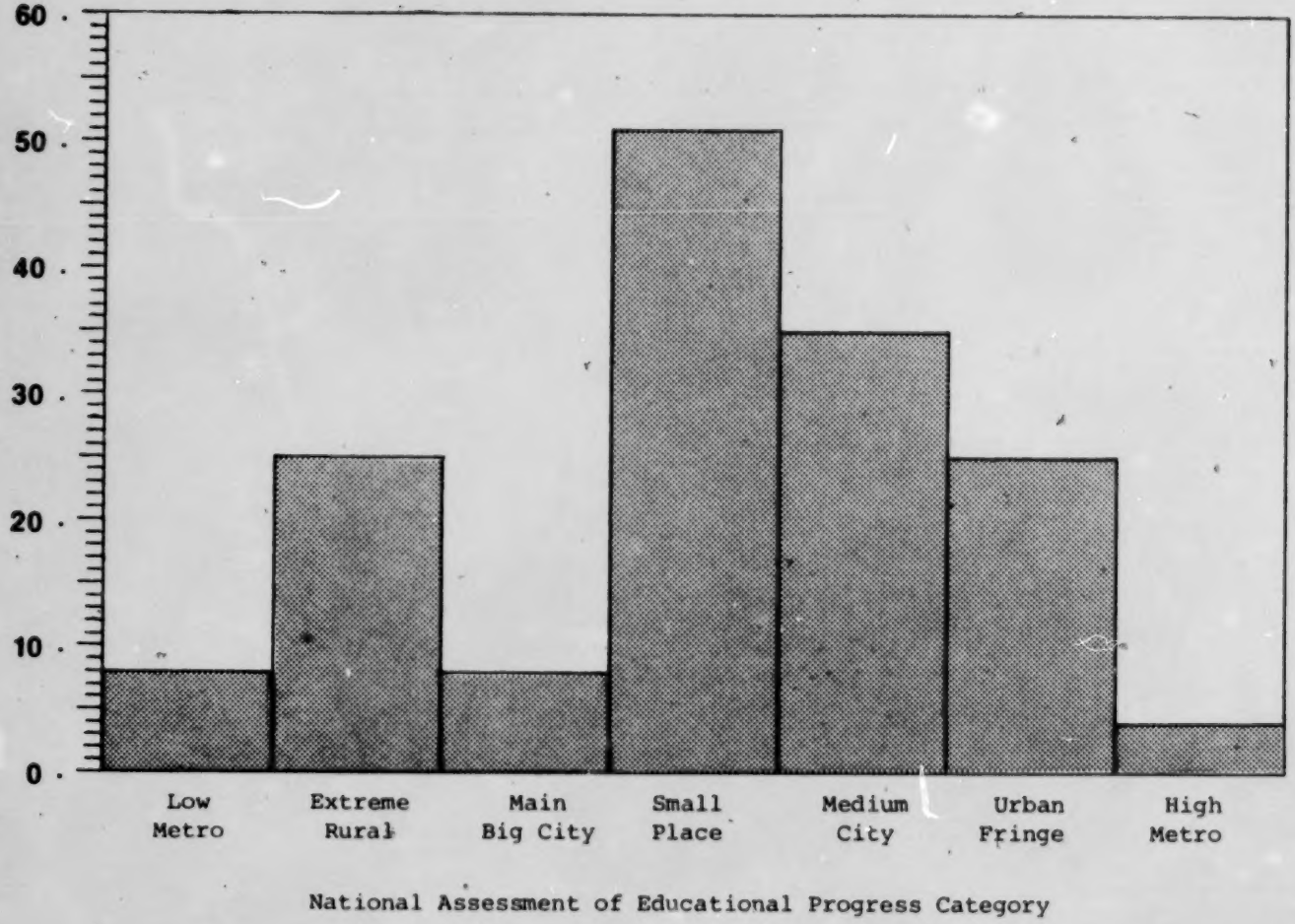

Figure 9. School's demographic setting.

pupils actually experience than the school-wide variables--processes which are supposed to mediate the influence of school-wide variables.

Two I&R units from each school are included in the study--one that includes children of grade 2 age and one that includes children of grade 5 age. Each measure of I&R unit practices may thus be thought of as having four versions: practices of the grade 2 I&R unit in reading, the grade 2 I&R unit in math, the grade 5 I&R unit in reading, and the grade 5 I&R unit in math.

In the following paragraphs, each measure of I&R unit practices is given a verbal definition. A description of the distribution and internal consistency is given for the four versions of each variable. Readers wanting to know more about a specific variable should refer to the detailed technical report which corresponds to that variable. Table 7 lists technical reports and the variables to which they correspond.

Utilization of Curriculum Resources (UCR). UCR is a measure of the extent to which the I&R unit uses a variety of IPM-compatible curricular materials and media in a particular subject area (reading, math).

The summary statistics for UCR in the sample of 156 schools are included in Table 8a. Histograms for the scaled composites are included in Figures 10a, 10b, 10c, and 10d. The internal consistencies (Cronbach's α's) are given in Table 8b.

Table 7

Technical Reports Describing Unit Variables Used in Phase I Study

I&R Unit Specific Variable	Technical Report No.[a]
Utilization of Curriculum Resources (UCR)	485
Information Acquisition (IA)	486
Individualization of Instructional Decisions (IDM)	487
Management of Grouping and of Instructional Continuity (IE)	488

[a]Madison, Wisconsin: Wisconsin Research and Development Center for Individualized Schooling, 1978.

Table 8a

Distribution of the Composites, Utilization of Curriculum Resources

Composite	Mean	SD	Median	Actual minimum	Logical minimum	Actual maximum	Logical maximum
UCR, Grade 2, Math	39.528	9.611	39.500	11.944	0	60.000	60.00
UCR, Grade 2, Reading	44.845	9.587	46.453	22.0	0	60.00	60.00
UCR, Grade 5, Math	40.148	9.530	40.000	12.00	0	60.0	60.0
UCR, Grade 5, Reading	44.770	9.89	44.667	19.910	0	60.00	60

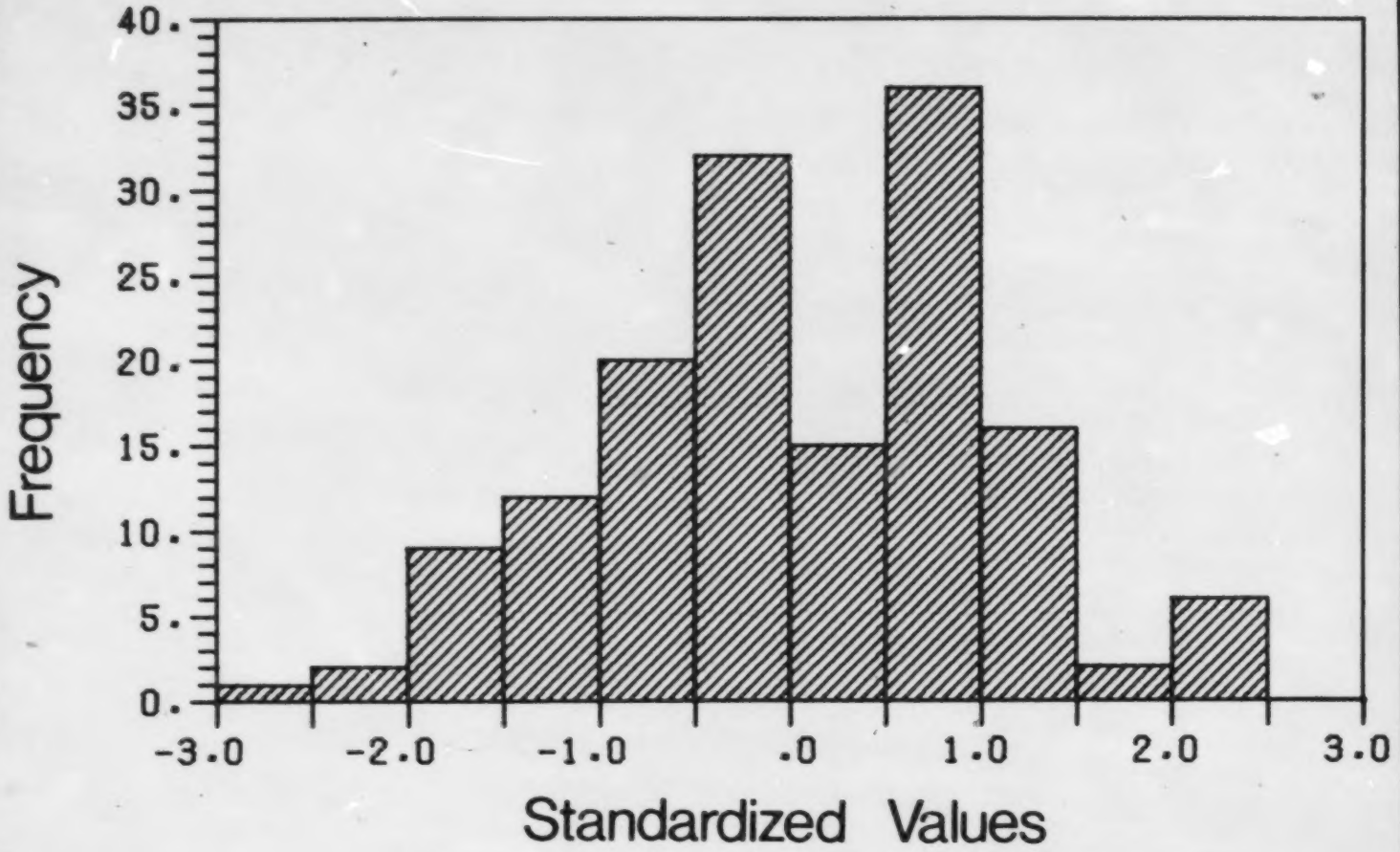

Figure 10a. Utilization of curriculum resources (second grade mathematics).

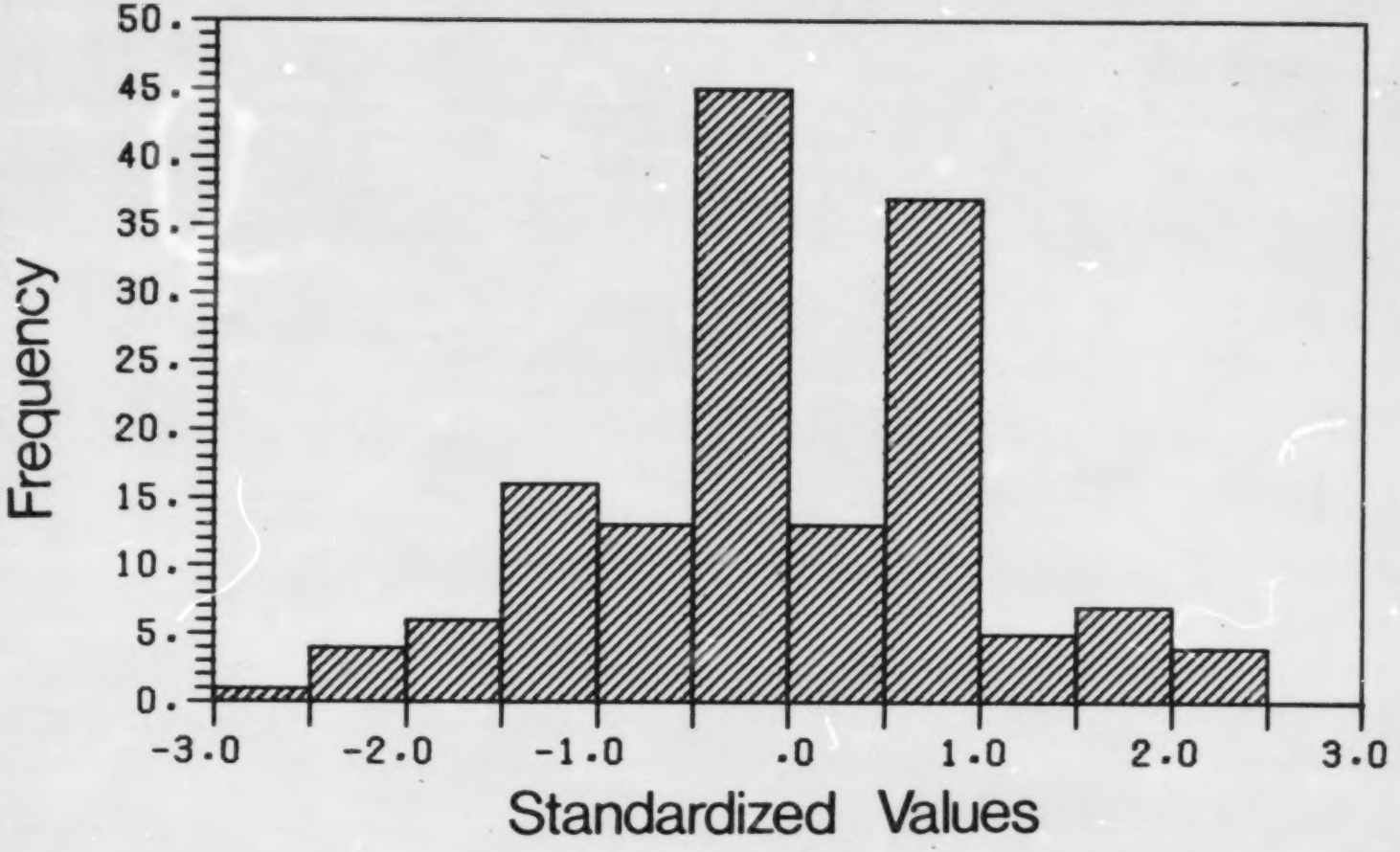

Figure 10b. Utilization of curriculum resources (fifth grade mathematics).

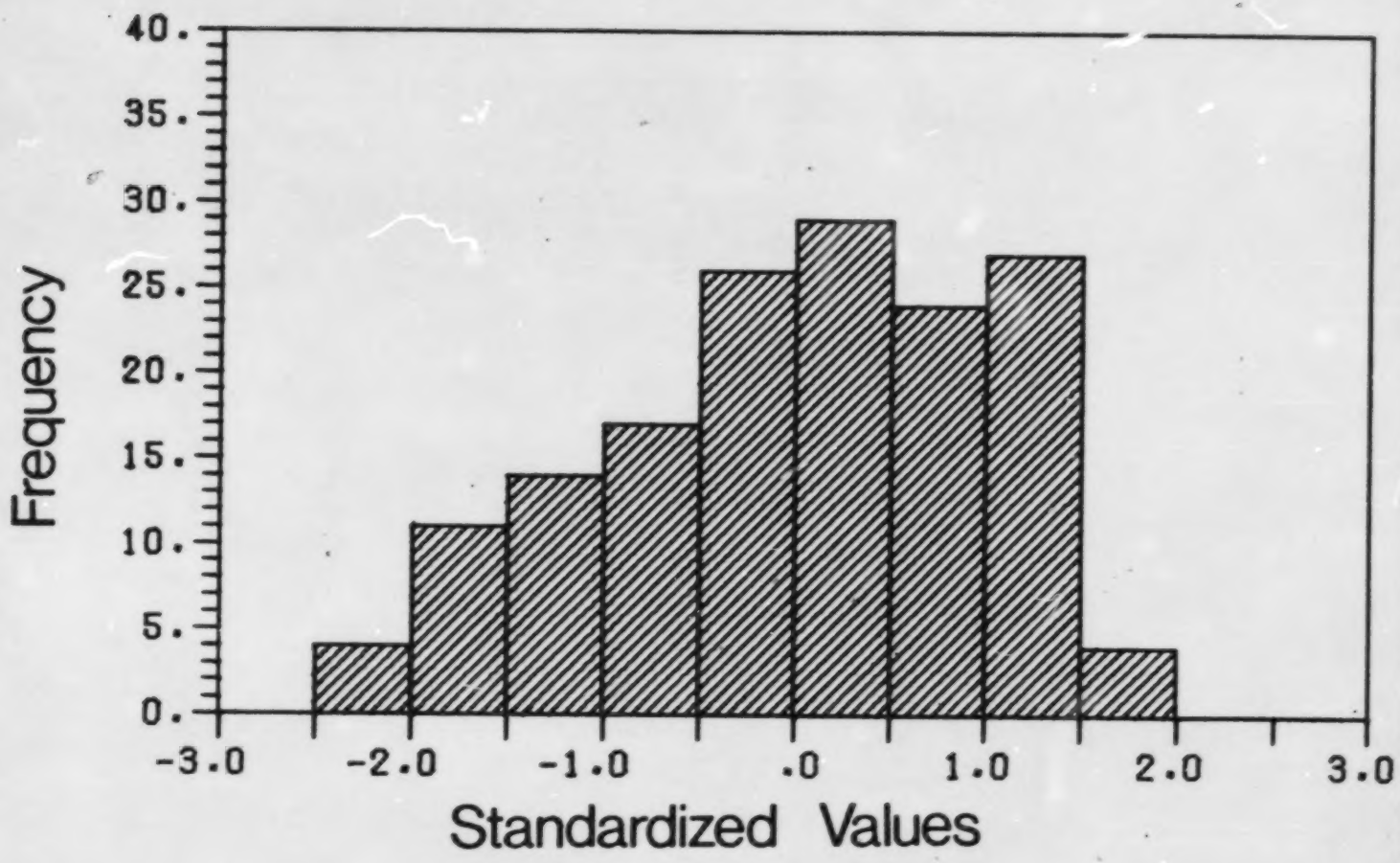

Figure 10c. Utilization of curriculum resources (second grade reading).

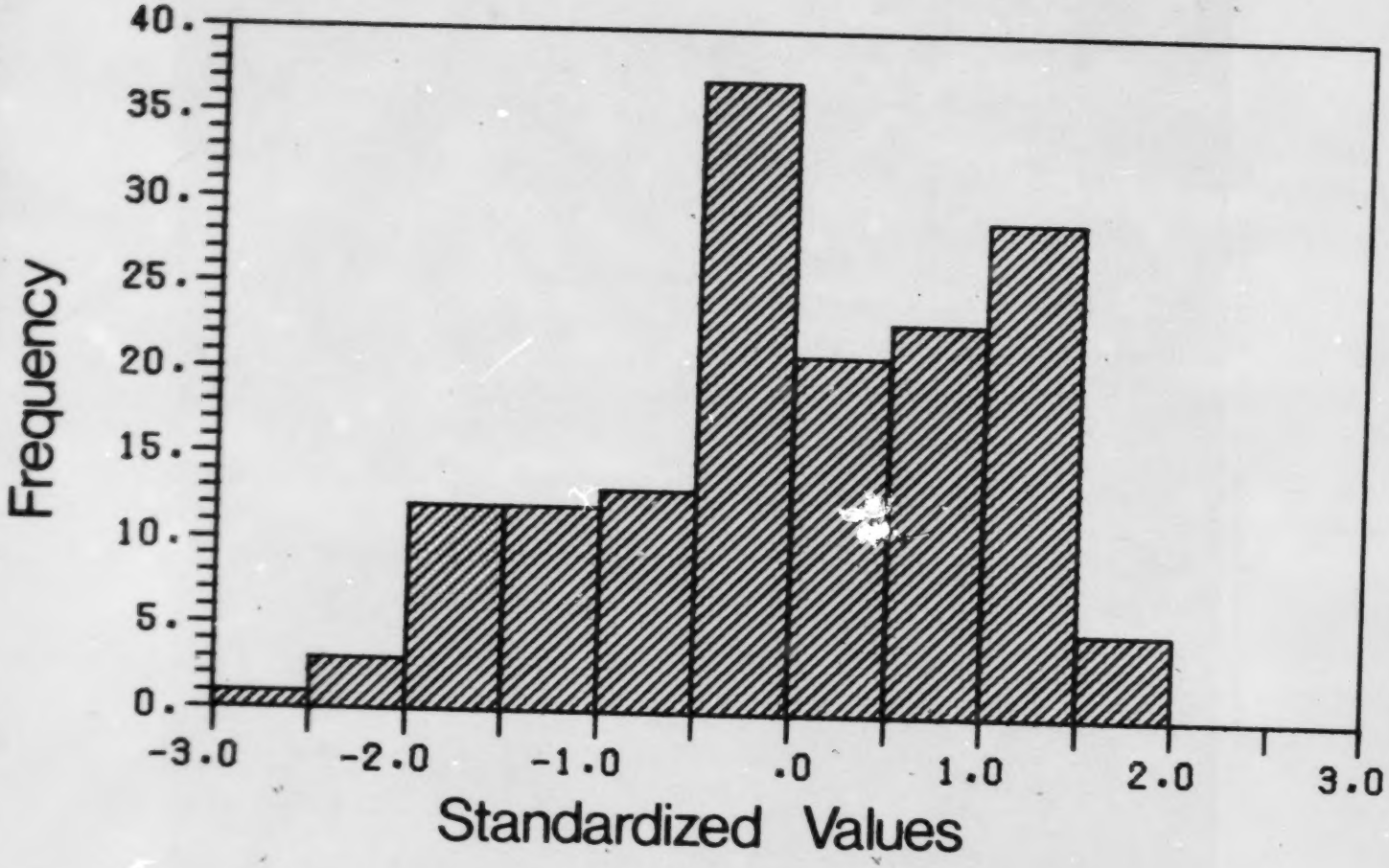

Figure 10d. Utilization of curriculum resources (fifth grade reading).

Table 8b

Internal Consistencies of the Utilization of Curriculum Resources and Its Constituents

	Variable	α in Grade 2 I&R Unit	α in Grade 5 I&R Unit
Composite:	Utilization of Curriculum Resources--Math	.29	.20
Constituents:	Setting Instructional Objectives	.43	.03
	Use of IPM Compatible Materials and Media	.03	.19
Composite:	Utilization of Curriculum Resources--Reading	.30	.35
Constituents:	Setting Objectives in Reading	.27	.27
	Reading Materials and Media	.29	.36
	Setting Objectives in Language Arts	.84	.84
	Language Arts Materials and Media	.17	.19

Information Acquisition (IA). IA is a measure of: (a) the completeness of information gathered for making decisions about the instruction of individual students; (b) the variety of means for gathering such information; and (c) the use of record keeping procedures by the I&R unit for organizing and retrieving the information. The measure is specific to subject area and to each I&R unit.

The distribution of IA based on the 156 schools of the Phase I sample, described in Table 9a, is in terms of the mean, standard deviation, median, actual minimum value obtained, logical minimum value obtainable, actual maximum value obtained, and logical maximum value obtainable. The internal consistencies of the IA composite and its constituents are presented in Table 9b. Figures 11a, 11b, 11c, and 11d are histograms of the composites.

Individualization of Instructional Decisions (IDM). IDM is a measure of the extent to which decisions affecting instruction are adapted to differences among students. This is made evident by the basis used for moving children to new material, the different rates of individual progress through curricular units, and the percentage of I&R unit meeting time spent making instructional decisions.

The distribution of Individualization of Instructional Decisions (IDM), based on the 156 schools in the Phase I sample, described in Table 10a, is in terms of the mean, standard deviation, median, actual minimum value obtained, logical minimum value obtainable, actual maximum value obtained, and logical maximum value obtainable. The internal consistencies (Cronbach's α's) of the IDM composites and their constituents are presented in Table 10b. Figures 12a, 12b, 12c, and

Table 9a

Distribution of the Composites, Information Acquisition (IA)

Composite	Mean	SD	Median	Actual minimum	Logical minimum	Actual maximum	Logical maximum
IA, Grade 2, Math	7.176	1.276	8.000	4.0	1	8.0	8
IA, Grade 2, Reading	7.005	.997	7.001	4.0	1	8.0	8
IA, Grade 5, Math	7.386	1.155	8.0	3.0	1	8.0	8
IA, Grade 5, Reading	6.928	1.015	7.0	4.5	1	8.0	8

Table 9b

Internal Consistencies of Information Acquisition and Its Constituents

	Variable	α in Grade 2 I&R Unit	α in Grade 5 I&R Unit
Composite:	Information Acquisition --Math	.00	.07
Constituents:	Record Keeping & Assessment --Math	.11	.23
	Attentiveness to Learner Characteristics	.77	.80
Composite:	Information Acquisition --Reading	.04	.00
Constituents:	Record Keeping & Assessment --Reading	.30	.37
	Nonachievement Assessment --Reading	.64	.70

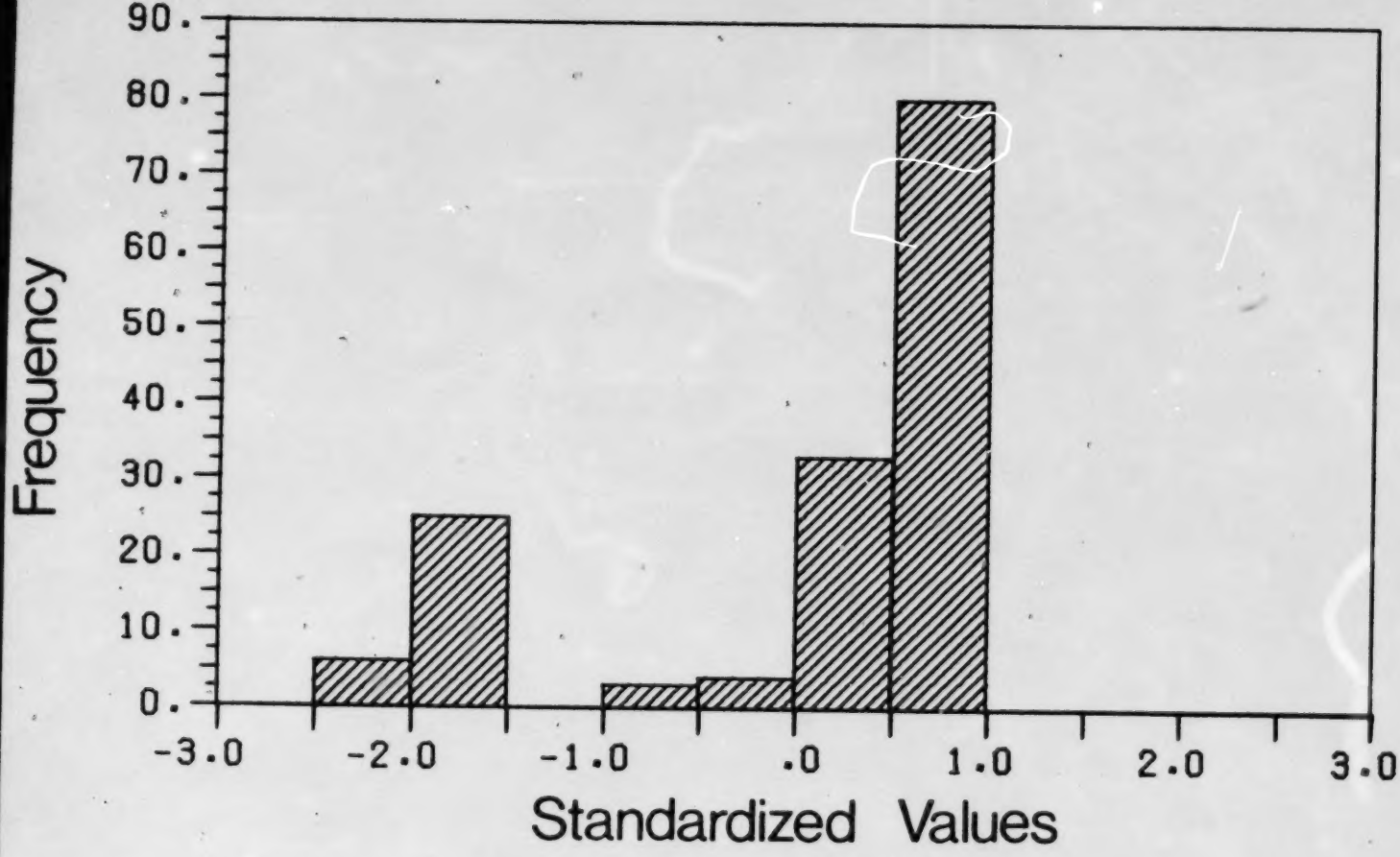

Figure 11a. Information acquisition (second grade mathematics).

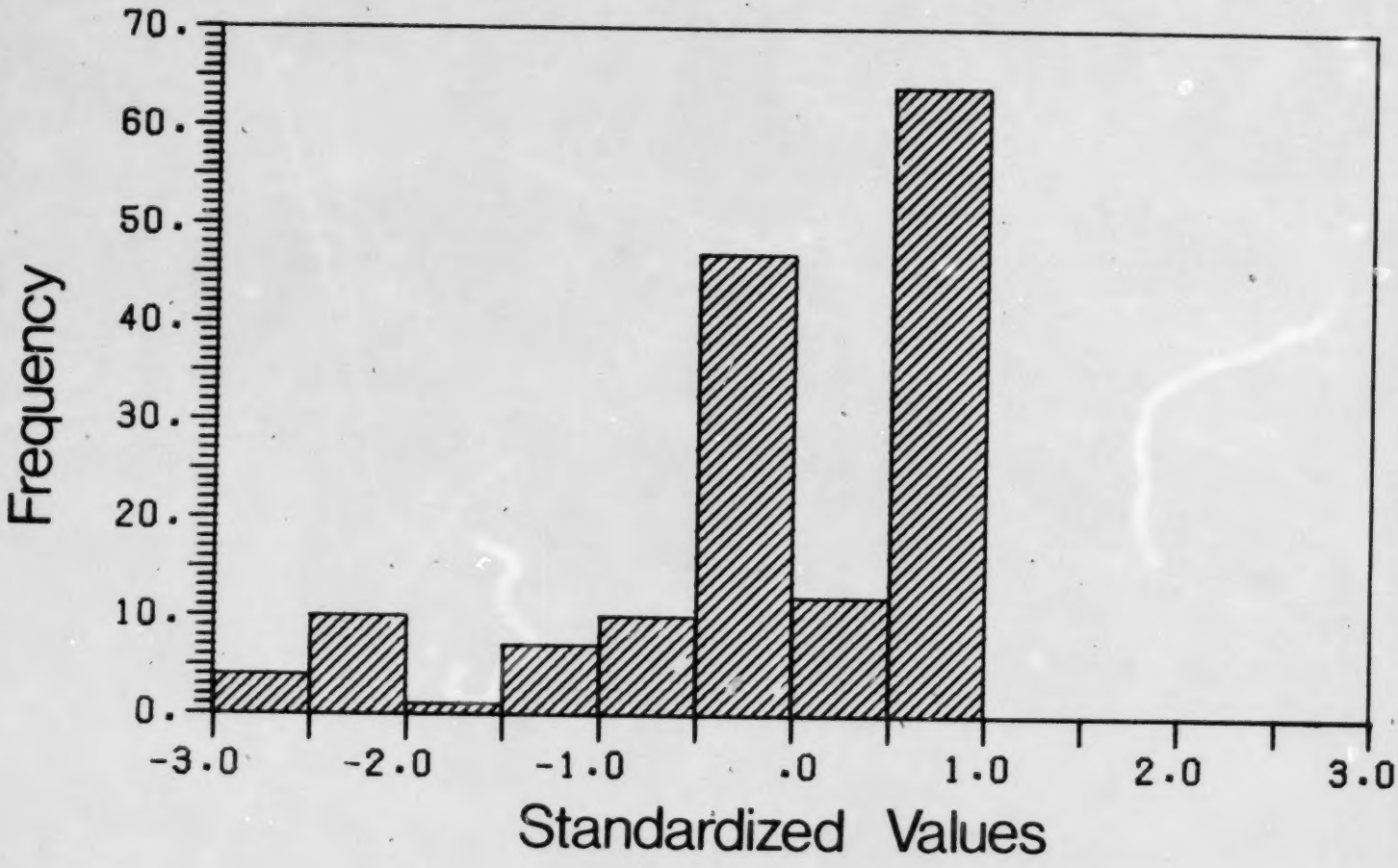

Figure 11b. Information acquisition (second grade reading).

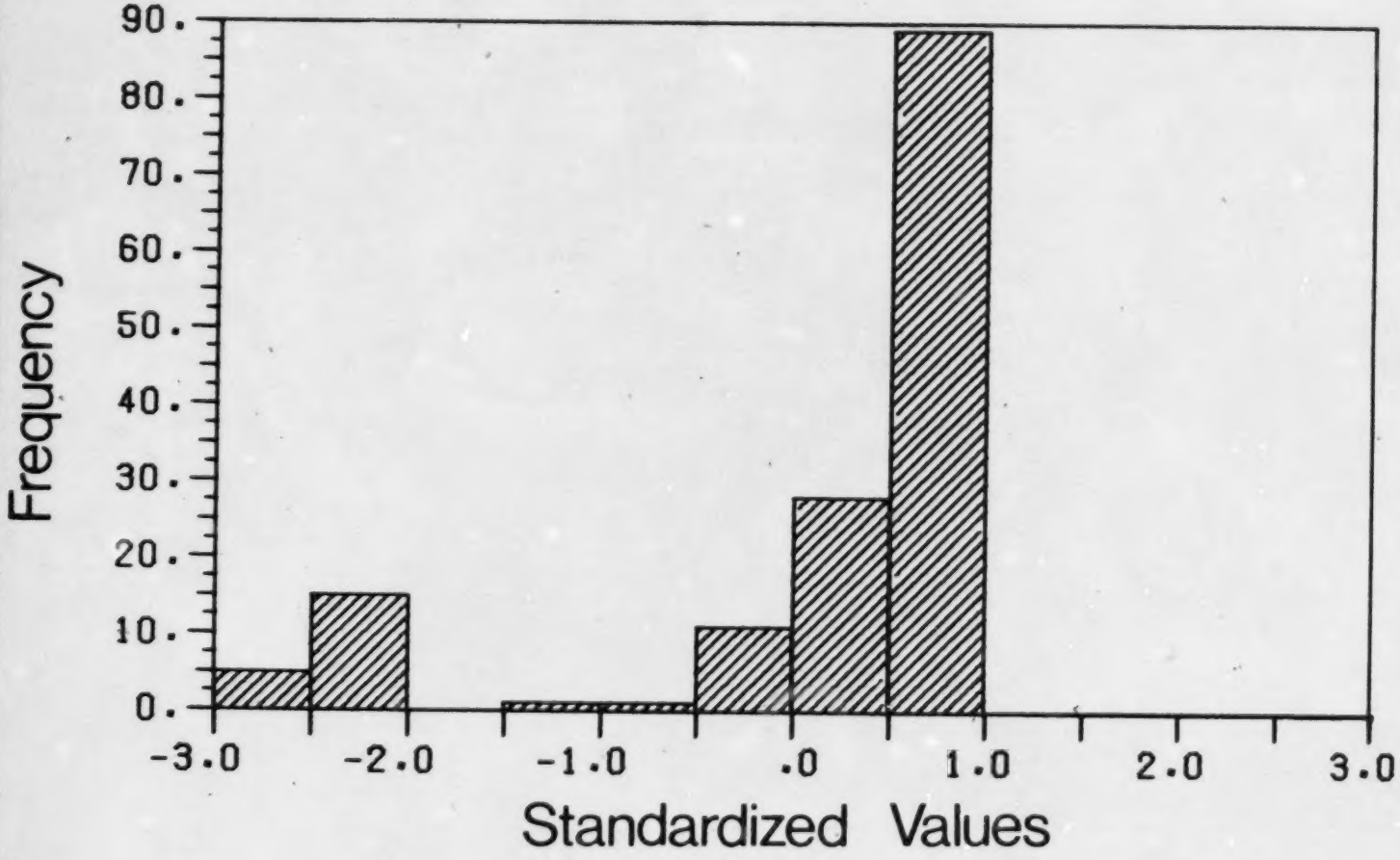

Figure 11c. Information acquisition (fifth grade mathematics).

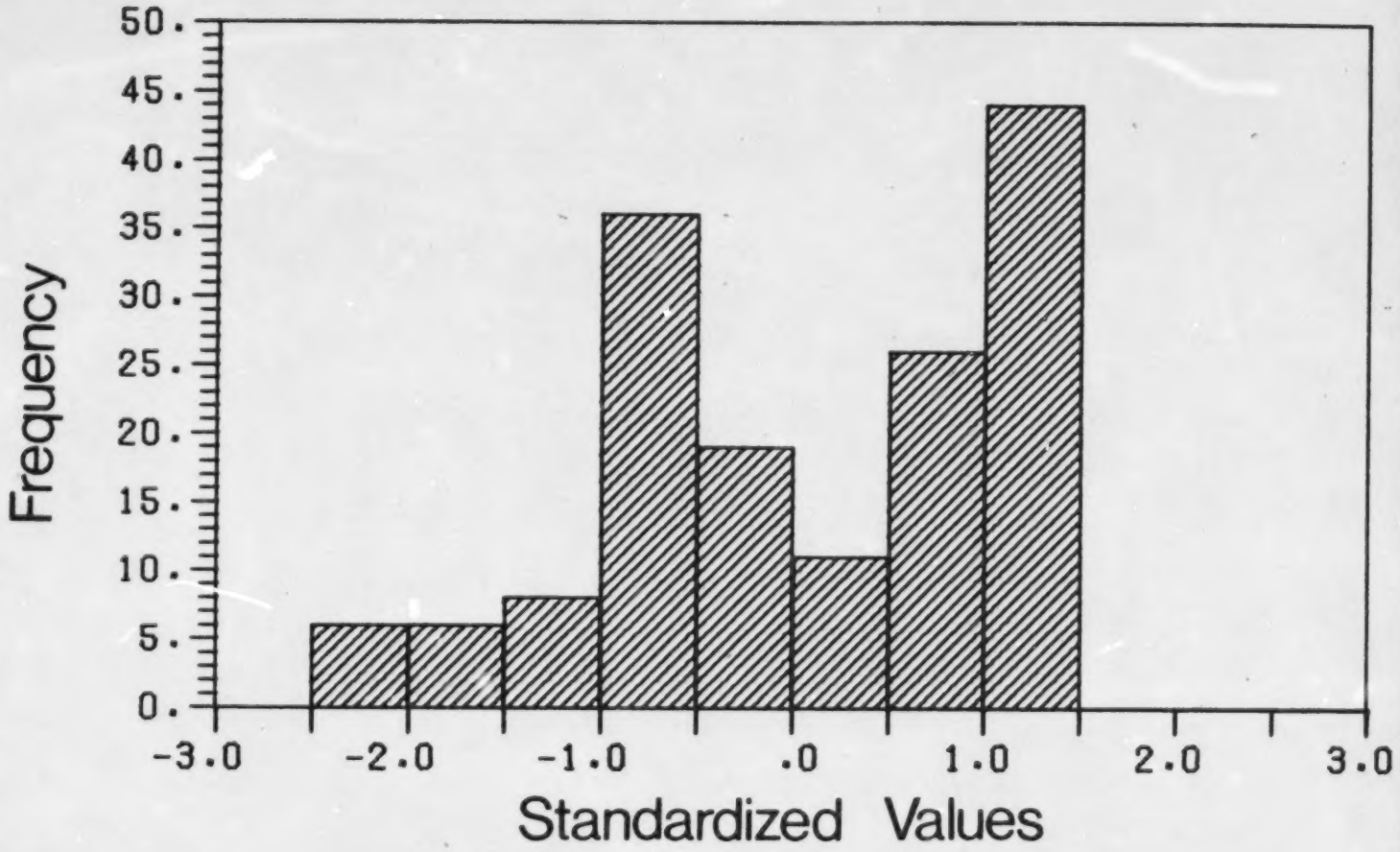

Figure 11d. Information acquisition (fifth grade reading).

Table 10a

Distribution of the Composites, Individualization of Instructional Decisions (IDM)

Composite	Mean	SD	Median	Actual minimum	Logical minimum	Actual maximum	Logical maximum
IDM, Grade 2, Math	8.332	2.605	8.000	1.000	0	14.00	14
IDM, Grade 2, Reading	8.158	2.379	8.223	2.333	0	13.00	14
IDM, Grade 5, Math	8.092	2.553	8.00	1.000	0	14.000	14
IDM, Grade 5, Reading	7.511	2.181	7.125	1.5	0	13.00	14

Table 10b

Internal Consistencies of Individualization of Instructional Decisions and Its Constituents

	Variable	α in Grade 2 I&R Unit	α in Grade 5 I&R Unit
Composite:	Individualization of Instructional Decisions --Math	.02	.10
Constituents:	I&R Unit Meeting Time to IDM	.40	.13
	Grouping Criteria--Math	.24	.14
Composite:	Individualization of Instructional Decisions --Reading	.08	.04
Constituents:	Grouping Criteria--Reading and Language Arts	.65	.50

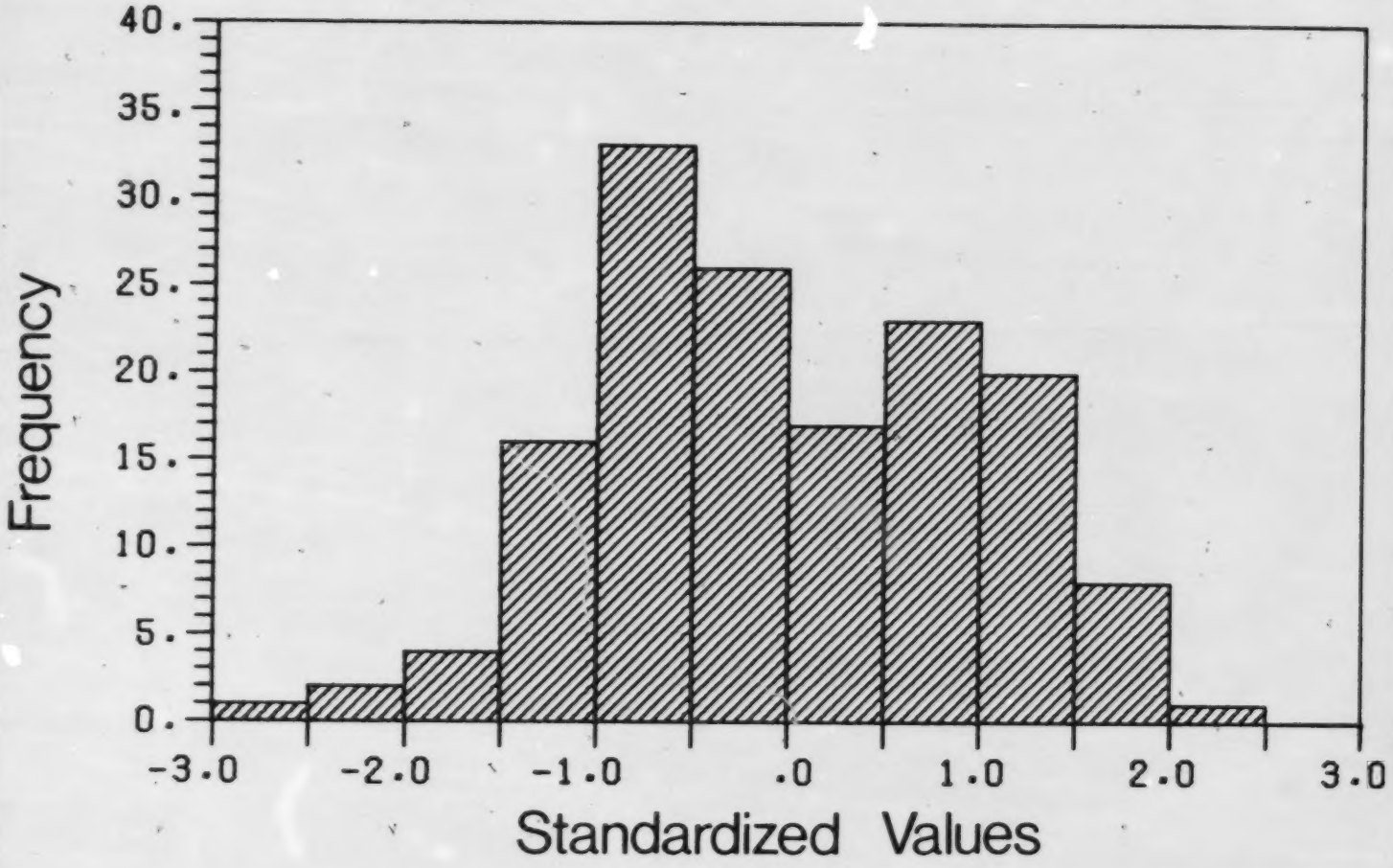

Figure 12a. Individualization of instructional decisions (second grade mathematics).

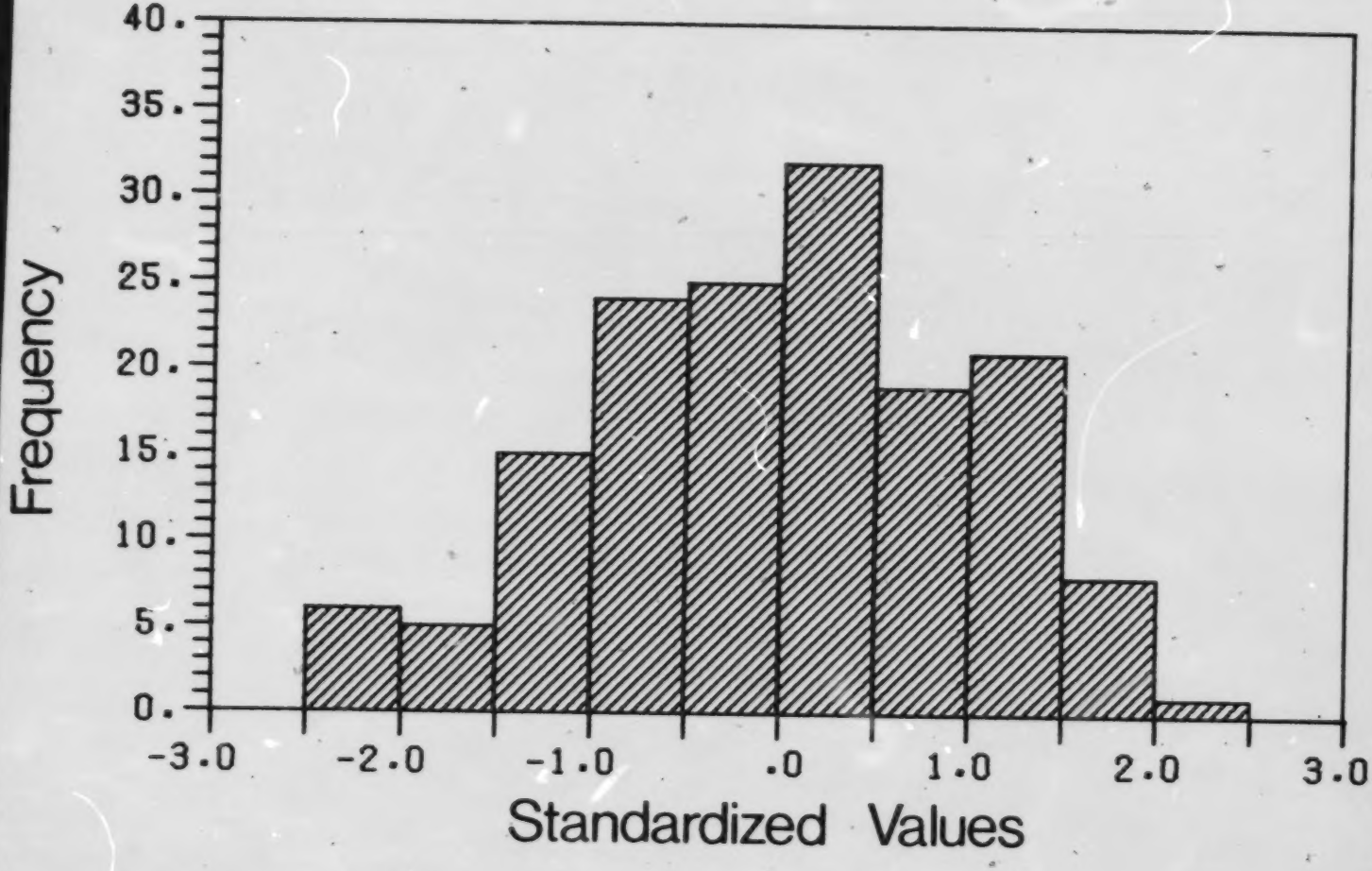

Figure 12b. Individualization of instructional decisions (second grade reading).

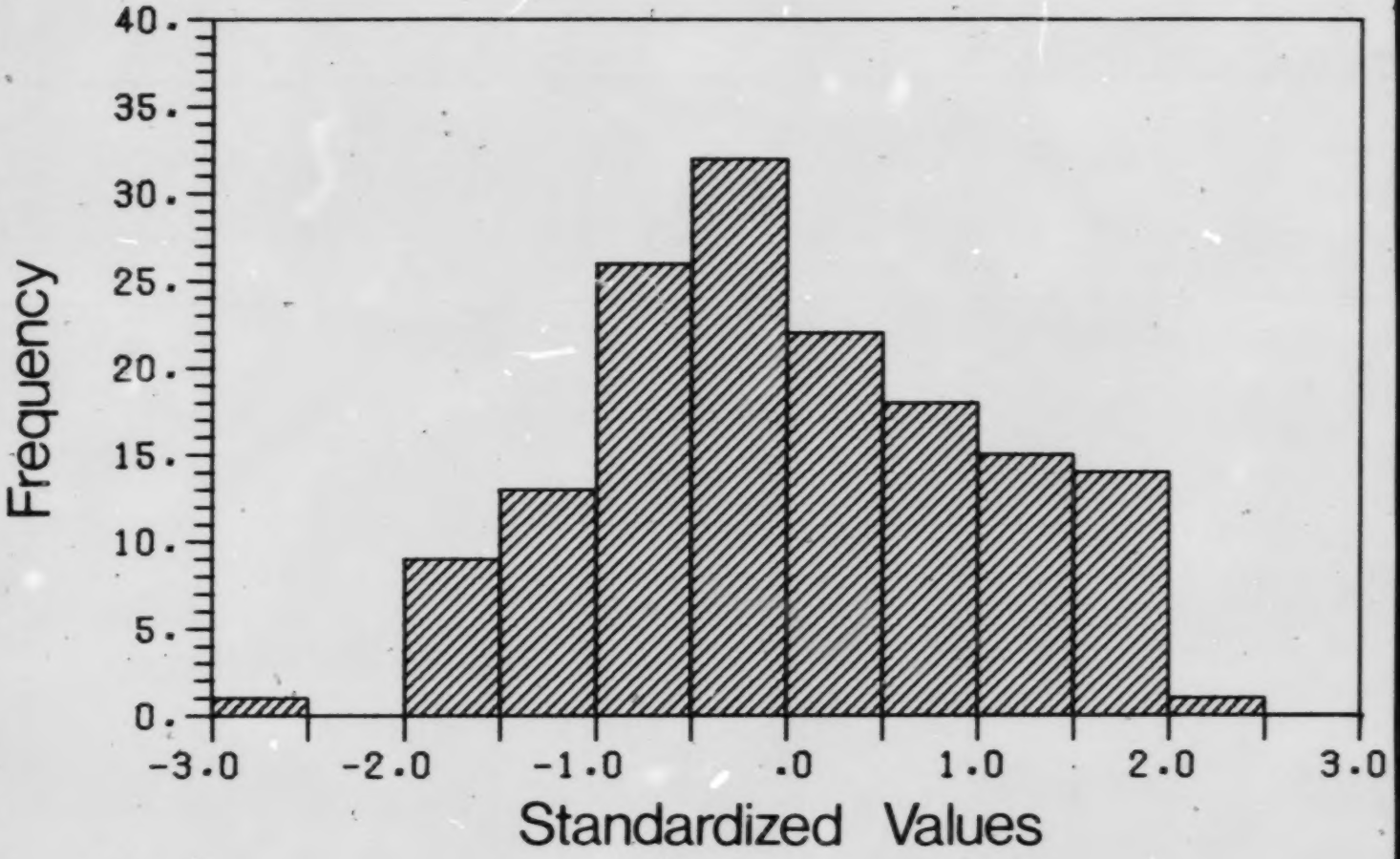

Figure 12c. Individualization of instructional decisions (fifth grade mathematics).

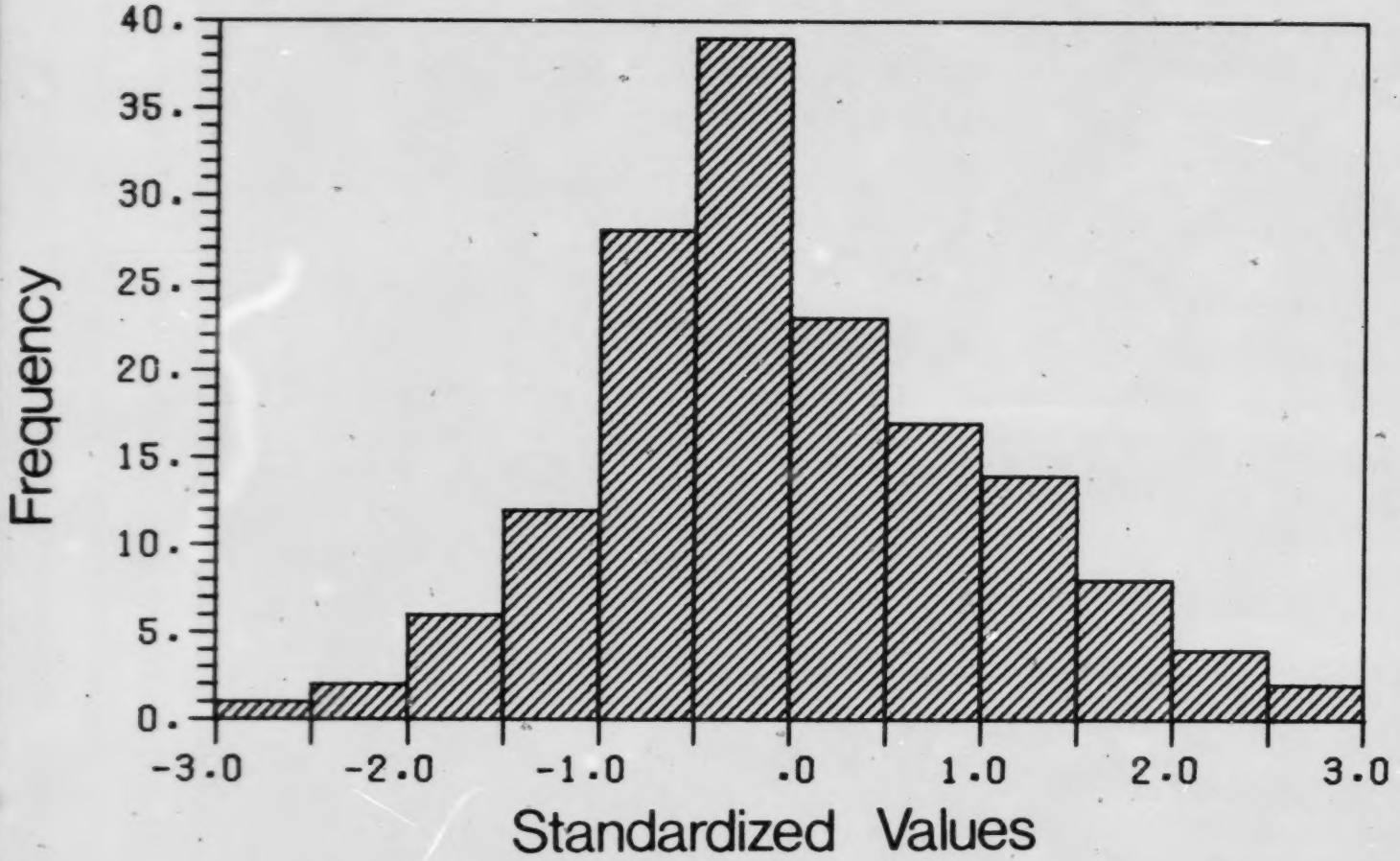

Figure 12d. Individualization of instructional decisions (fifth grade reading).

12d are histograms of these composites.

Management of Grouping and of Instructional Continuity (IE). IE is a measure of several aspects of environmental organizations. This variable includes arrangement of the instructional environment in terms of scheduling, group size and change patterns, and opportunities for children to become aware of interrelationships and continuity in instruction.

Summary statistics for IE based on the 156 schools in the Phase I evaluation sample are provided in Table 11a. Table 11b provides internal consistencies (Cronbach's α's) for IE and its constituents. Figures 13a, 13b, 13c, and 13d are histograms of these four composites.

Allocated Learning Time (ALT). ALT is a measure of the instructional time I&R unit teachers report as being devoted to learning activities concerned with specific subject areas.

The distribution of Allocated Learning Time (ALT) based on the 156 schools of the Phase I sample, described in Table 12a is in terms of the mean, standard deviation, median, actual minimum value obtained, logical minimum value obtainable, actual maximum value obtained, and logical maximum value obtainable. The internal consistencies of the ALT composites and their constituents are presented in Table 12b. Figures 14a, 14b, 14c, and 14d are histograms of these composites.

Teacher Job Satisfaction (JOBSAT). JOBSAT is a school-wide measure of teachers' satisfaction with a variety of aspects concerning their school and profession. Readers wanting to know more about teacher job satisfaction should refer to Price, Janicki, Howard, Stewart, Buchanan, & Romberg, 1978.

Table 11a

Summary Statistics for the Composites, Management of Grouping and of Instructional Continuity (IE)

Composite	Mean	SD	Median	Actual minimum	Logical minimum	Actual maximum	Logical maximum
IE, Grade 2, Math	29.581	7.258	30.000	14.0	0	45.750	48
IE, Grade 2, Reading	28.638	6.120	28.338	13.668	0	45.00	48
IE, Grade 5, Math	28.536	7.805	28.250	12.0	0	45.00	48
IE, Grade 5, Reading	26.339	5.907	26.000	11.00	0	42.875	48

Table 11b

Internal Consistencies of Management of Grouping and of Instructional Continuity (IE) and Its Constituents

	Variable	α in Grade 2 I&R Unit	α in Grade 5 I&R Unit
Composite:	IE-Math	.19	.22
Constituents:	Unit Group Size	.35	.35
	Regrouping Practices	.35	.51
	Perceivable Sequence	--[a]	--[a]
	Perceivable Interrelationships	--[a]	--[a]
	Number of Objectives	--[a]	--[a]
	Instruction Continuity	.00	.00
Composite:	IE-Read	.58	.63
Constituents:	Reading Component	.05	.08
	Language Arts Component	.15	.02

[a]This is a one-item constituent; therefore, the internal consistency cannot be calculated.

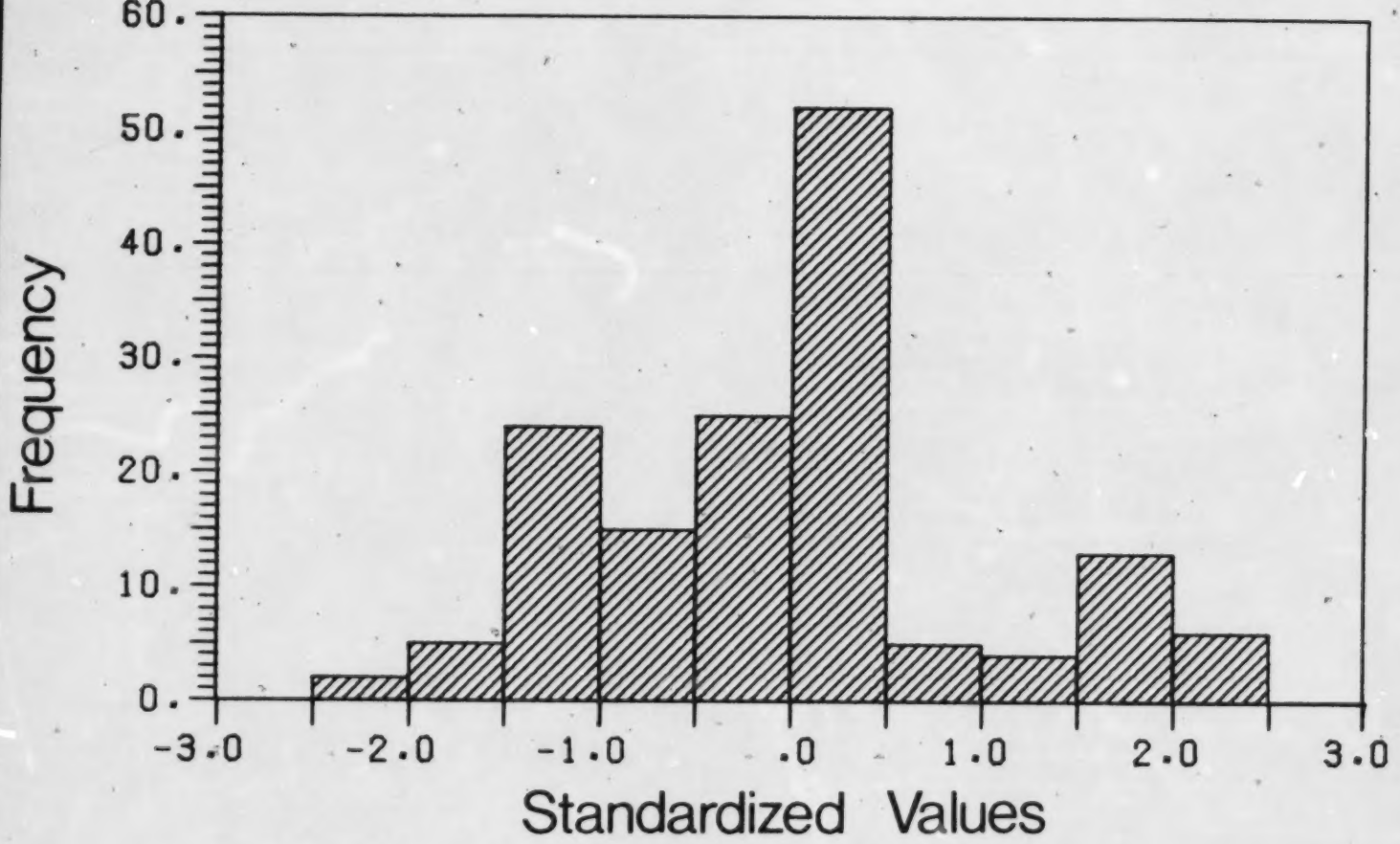

Figure 13a. Management of grouping and of instructional continuity (second grade mathematics).

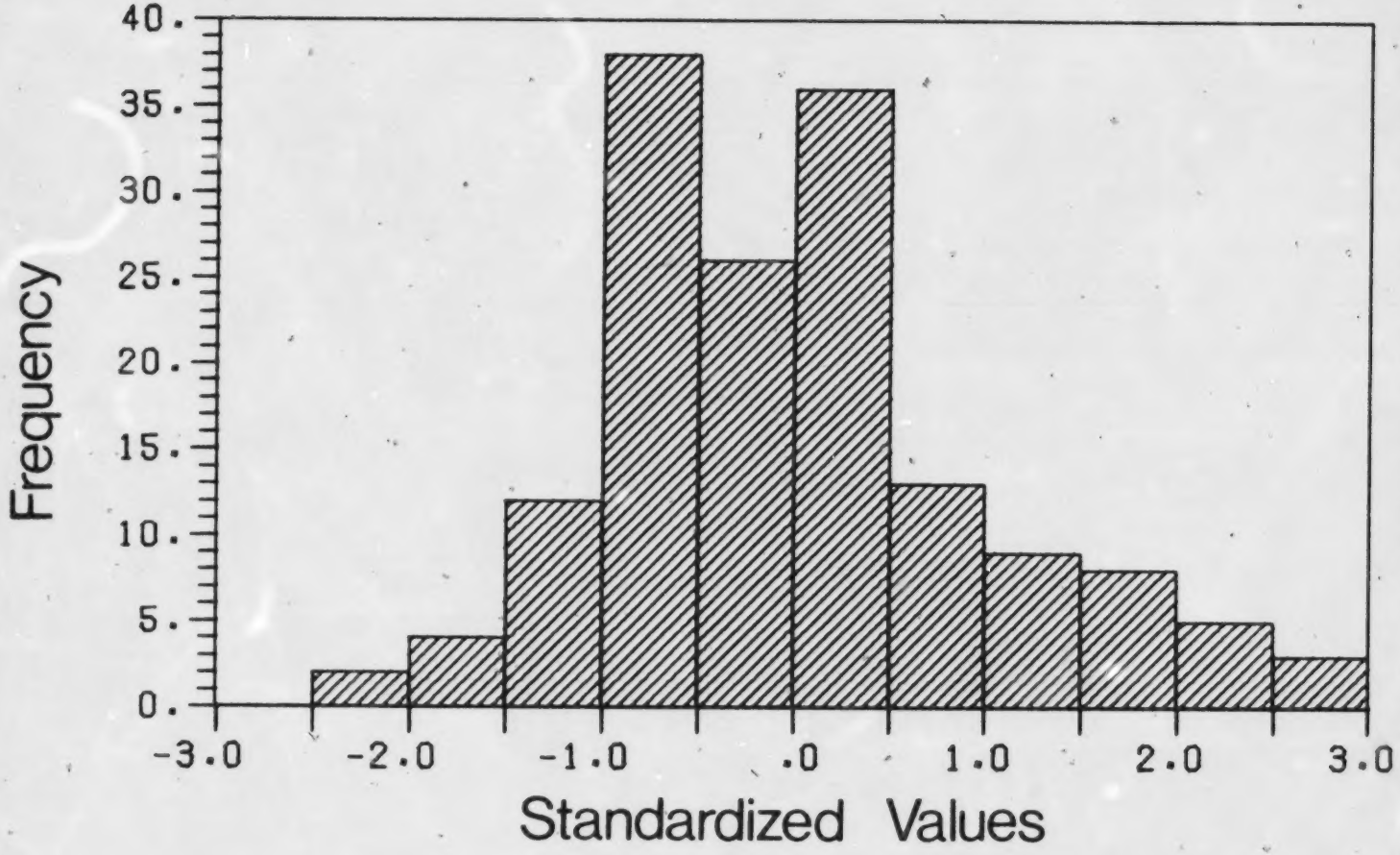

Figure 13b. Management of grouping and of instructional continuity (second grade reading).

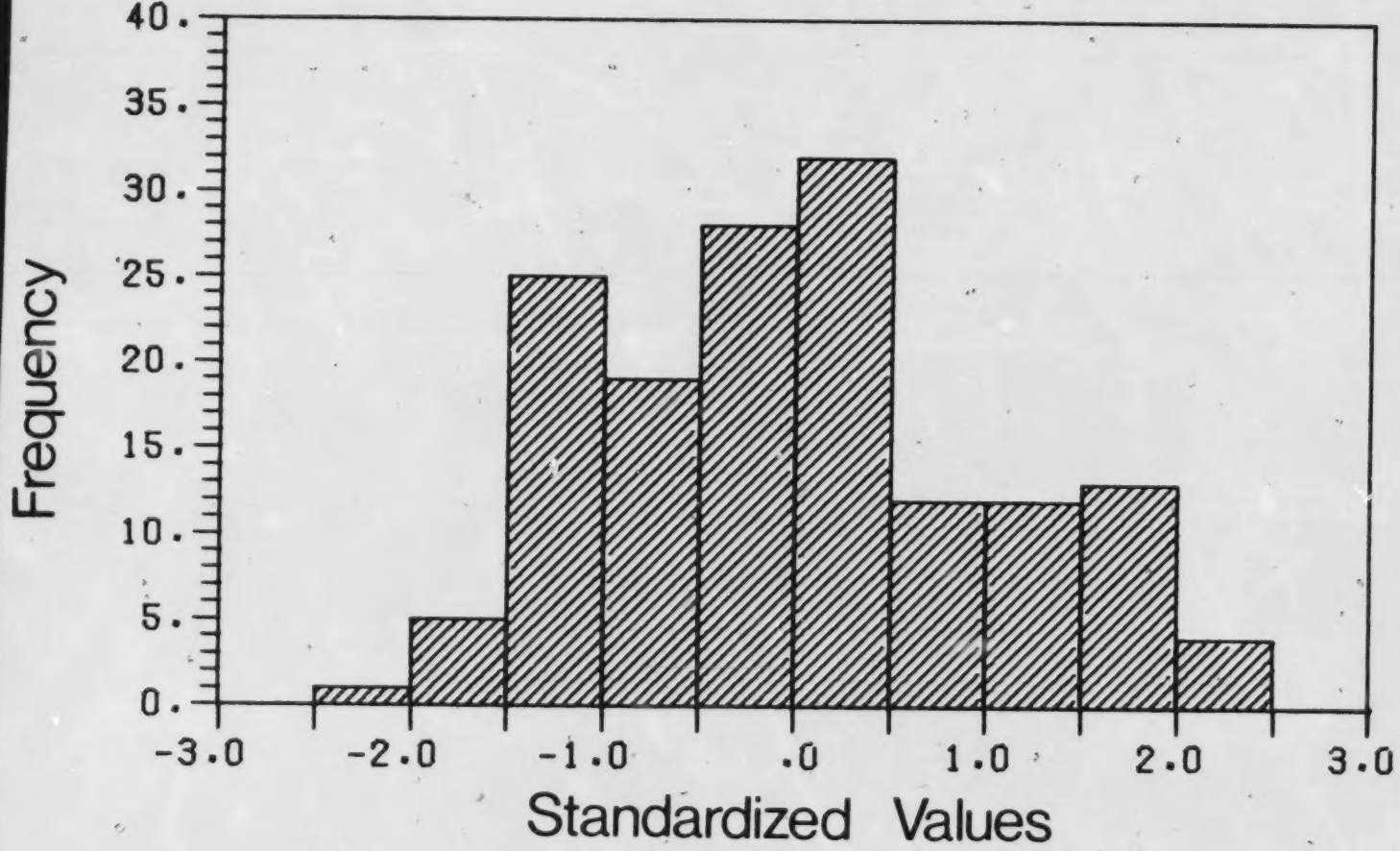

Figure 13c. Management of grouping and of instructional continuity (fifth grade mathematics).

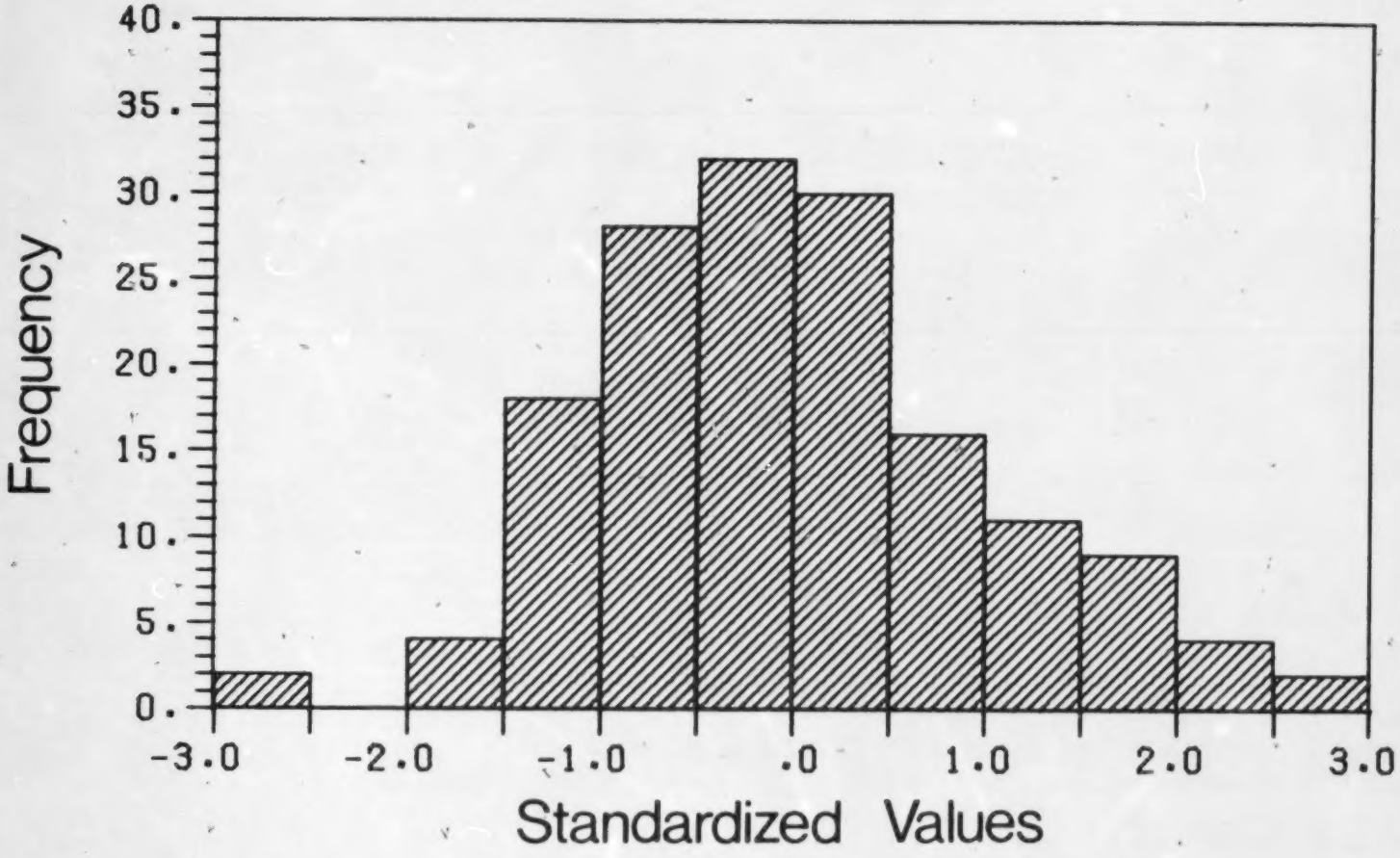

Figure 13d. Management of grouping and of instructional continuity (fifth grade reading).

Table 12a

Distribution of Allocated Learning Time (ALT)

Composites	Mean	SD	Median	Actual minimum	Logical minimum	Actual maximum	Logical maximum
ALT, Grade 2, Math	1.046	.504	1.016	0	0	4.0	4.0
ALT, Grade 2, Reading	1.898	.760	1.667	0	0	4.0	4.0
ALT, Grade 5, Math	1.045	.461	1.011	0	0	4.0	4.0
ALT, Grade 5, Reading	1.179	.576	1.108	0	0	4.0	4.0

Table 12b

Internal Consistency of Allocated Learning Time (ALT)

Variable	α in Grade 2 I&R Units	α in Grade 5 I&R Units
Allocated Learning Time -- Math	--[a]	--[a]
Allocated Learning Time -- Reading	.20	.54

[a]The internal consistency cannot be calculated since this is a one-item composite.

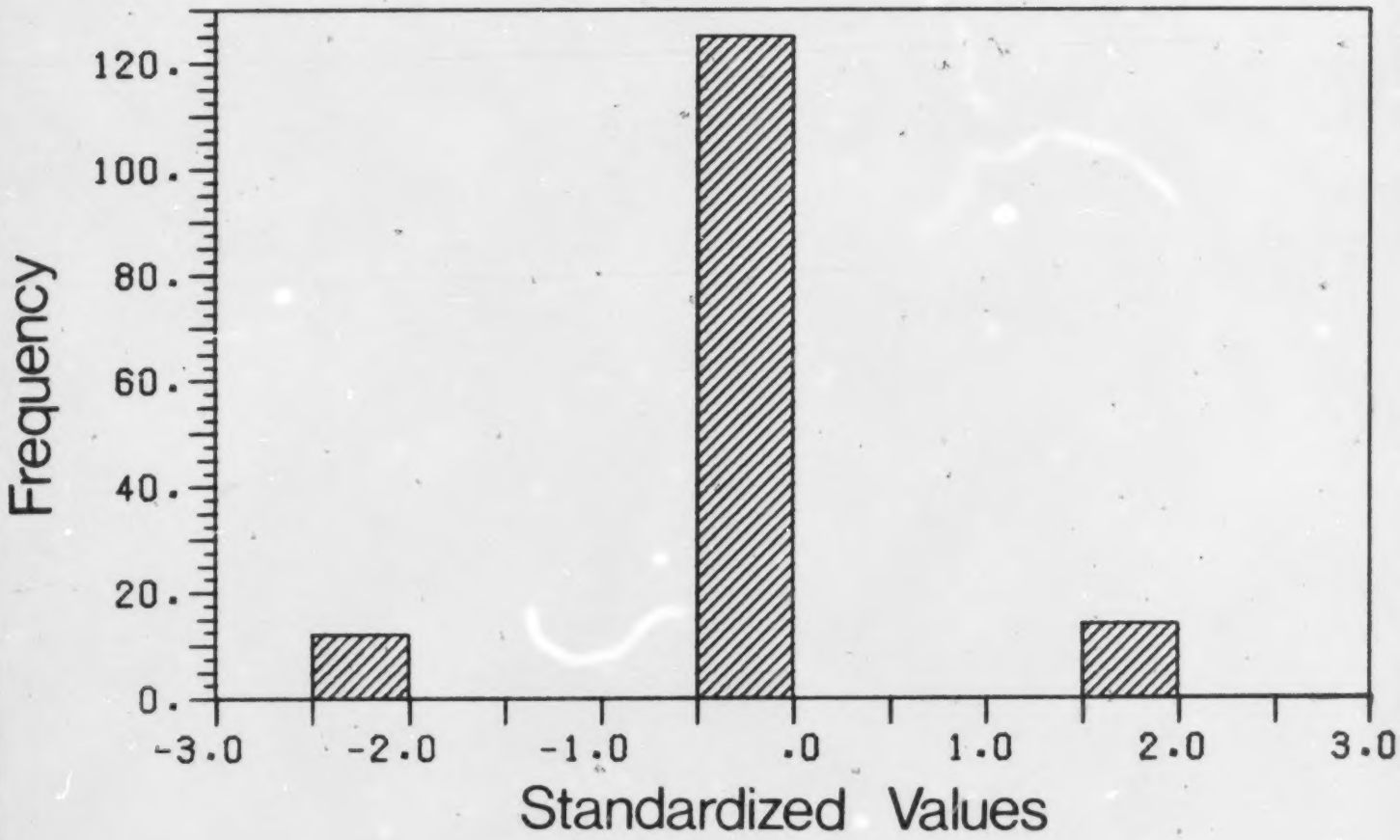

Figure 14a. Allocated learning time (second grade mathematics).

Summary statistics for Teacher Job Satisfaction (JOBSAT) in the Phase I sample of 156 schools are: mean = 40.571; SD = 5.079; median = 41.001; actual minimum = 24.60; logical minimum = 0; actual maximum = 50.0; and logical maximum = 50.0. A histogram for JOBSAT is included in Figure 15. The internal consistency (Cronbach's α) of CJOBSAT is .94.

Discussion of the Structural Model

The following discussion refers to the model presented in Figure 1. Student achievement in reading and mathematics is thought to be directly influenced by five variables. Two of these can be controlled by the unit teachers; they are Management of Grouping and Instructional Continuity (IE) and Individualization of Instructional Decisions (IDM). The other three variables, IQ, Demographic Background (DB), and Allocated Learning Time (ALT), are not controllable by the unit teacher, and, therefore, their effects on student achievement will be statistically controlled.

The IGE model suggests that the organization of classroom instruction should have an effect on student achievement. The Instructional Programming Model (IPM) is used to group students according to their individual needs, thus making teacher-student instructional interactions more effective. The variable Management of Grouping and Instructional Continuity (IE) measures several facets of the classroom instructional environment and should, according to the IGE model, be directly related to student learning.

The variable Individualization of Instructional Decisions (IDM) measures the extent to which instructional decisions acknowledge the

individual needs of the student. Taking individual student needs into account is the cornerstone of the IGE model. Therefore, this variable is expected to be directly related to student achievement as well as indirectly related through the influence IDM has on IE.

The amount of time actually allocated to instruction should limit the potential influence of the IGE organizational and instructional variables on eventual student achievement. The amount of time set aside for math and reading instruction may be mandated by the district or principal; therefore, ALT will be included as a covariate. The school's demographic setting (DB) is also a covariate of student achievement. It serves as an index of a variety of pre-existing differences among students which may affect student achievement.

The IGE model suggests that three variables, two instructional and one organizational, in our structural model should directly influence the I&R unit's Management of Grouping and of Instructional Continuity (IE). The variable Utilization of Curriculum Resources (UCR) is expected to affect IE because units properly using their curricular resources should be more flexible and effective in grouping and regrouping students. Also the unit that effectively individualizes instructional decisions (IDM) is expected to be better at managing grouping and instructional continuity. All of the instruction in the units should be affected by the implementation of the IPM according to the IGE model. The variable that measures this implementation, General Implementation of Instructional Programming Model (SIPM), is expected to affect IE both directly and indirectly.

Individualization of Instructional Decisions should be influenced by two variables, Information Acquisition (IA) and General Implementation of Instructional Programming Model (SIPM). Information Acquisition (IA) in the I&R units is expected to be influenced by the school-wide General Implementation of the Instructional Programming Model (SIPM). The procedures needed for efficient and useful information acquisition should be limited by an incomplete school-wide implementation of the IPM. Conversely, according to the IGE concept a well-implemented school-wide IPM should lead to high quality information acquisition in each unit.

Two school-wide variables, SIPM and Interorganizational Relations (IOR), and unit instructional variable IA are expected to directly affect the unit's use of curricular resources in reading and math (UCR). The IGE model expects that schools which had collected useful information on students (IA) would be better able to fit the curriculum to the students' needs. Also, a fully implemented IPM would positively affect the variety of IPM-compatible curricular materials being used. Conversely, a poorly implemented IPM would have a detrimental effect on the use of curricular resources. The school's Interorganizational Relations would be expected to influence UCR. This is because active members of an IGE organization would have a greater opportunity to become familiar with the curricular materials used by a well-functioning IGE school. On the other hand, an isolated IGE school would have less opportunity to become familiar with other curricula and to discuss the best use of existing curricula with other IGE schools.

The variable General Implementation of Instructional Programming Model is a key school-wide variable in our model. This variable

mediates the effect of the school's organizational and teacher background variables on the unit's specific instructional variables. It is only fitting that the key feature in the IGE model, the IPM, should be the central variable in our structural model. The school variables, Procedures Fostering Coordination and Improvement of School Program and Intraorganizational Structure, along with the staff variables, General Staff Background and Belief in Individual Differences, are all expected to directly influence the General Implementation of the Instructional Programming Model.

Four variables, Interorganizational Relations (IOR), Procedures Fostering Coordination and Improvement of the School Program (GOS), Intraorganizational Structure (IOS), and General Implementation of the Instructional Programming Model (SIPM), should relate to teacher Job Satisfaction. The IGE model suggests that the amount of communication with other IGE schools (IOR) should help teachers feel better about their skills and be more satisfied with teaching. The IGE model also suggests that the well-functioning IGE school (schools high on GOS, IOS, and SIPM would be considered well-functioning IGE schools) would have satisfied teachers.

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Price, G. G., Janicki, T. C., Howard, J. A., Stewart, D. M., Buchanan, A. E., & Romberg, T. A. Procedures used in Phase I of the IGE evaluation to scale the variable Teacher Job Satisfaction (Technical Report 484). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1978.

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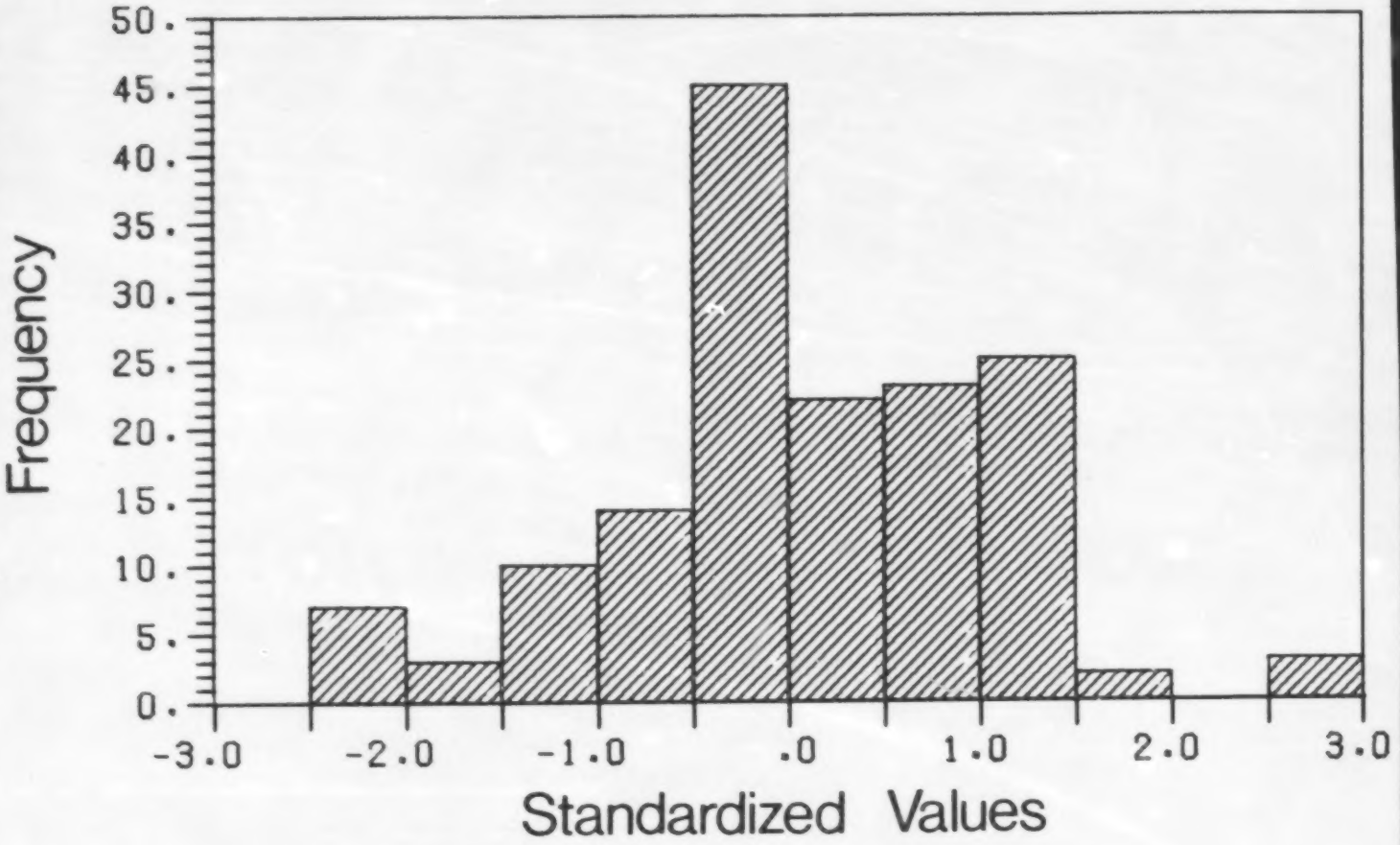

Figure 14b. Allocated learning time (second grade reading).

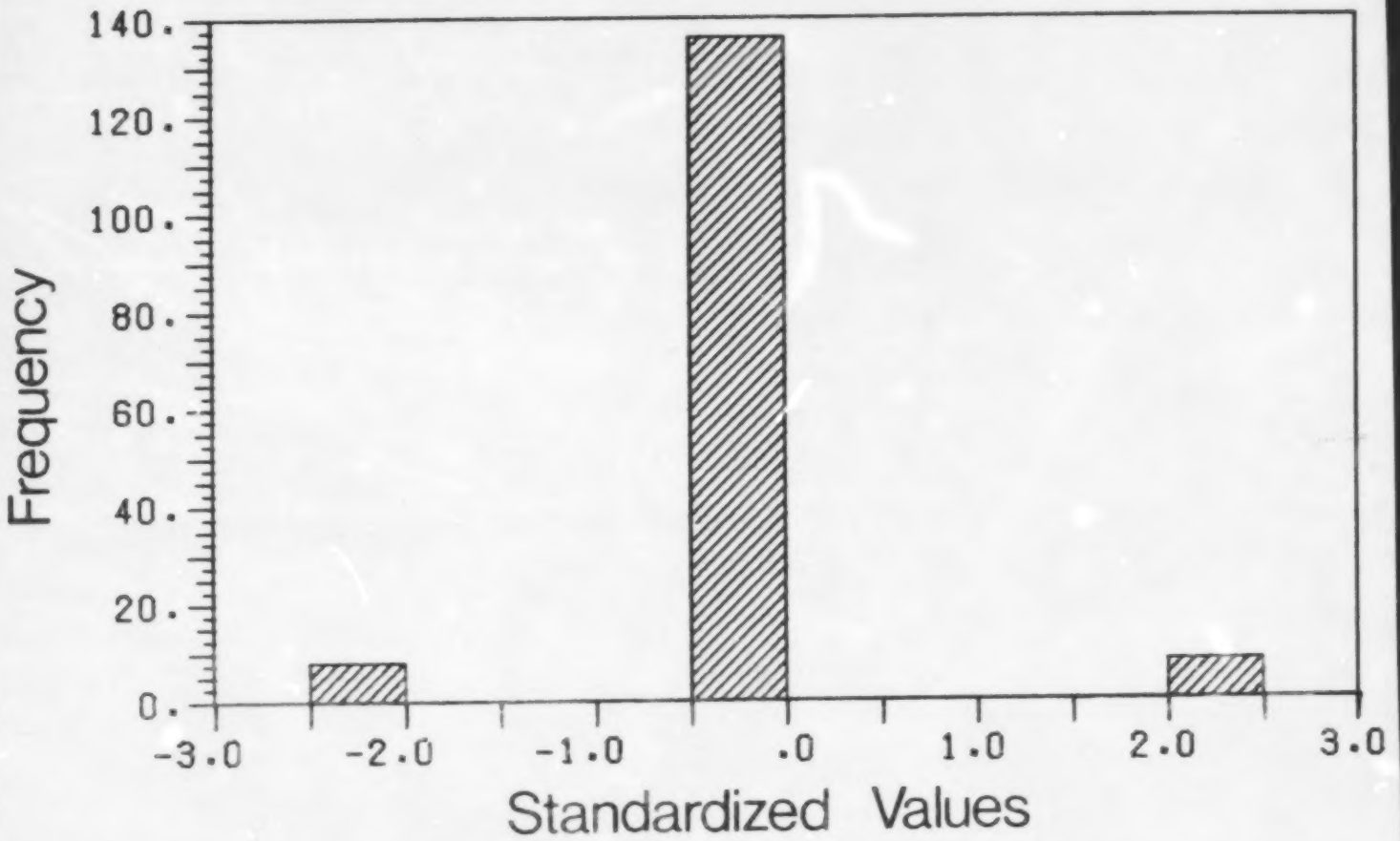

Figure 14c. Allocated learning time (fifth grade mathematics).

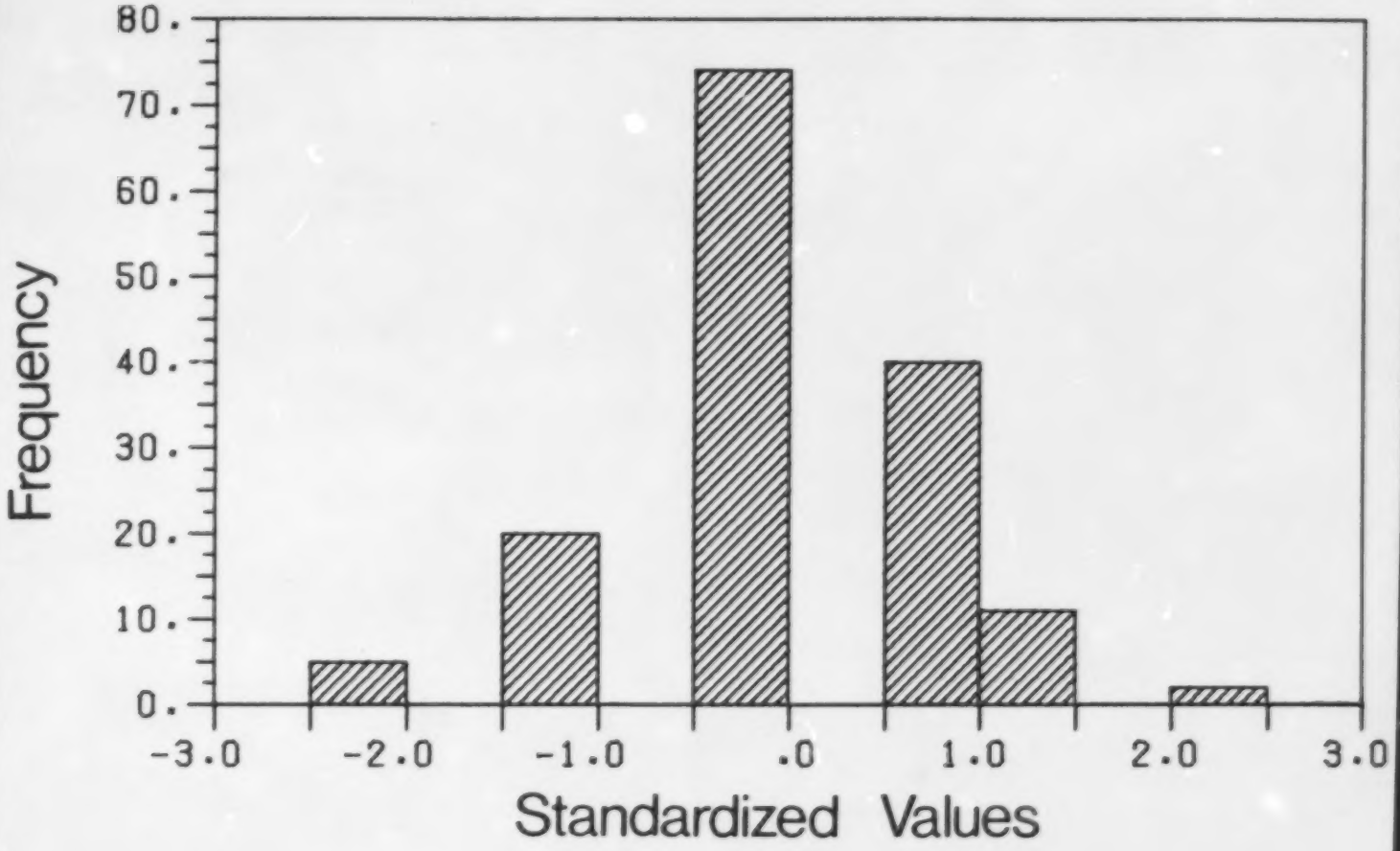

Figure 14d. Allocated learning time (fifth grade reading).

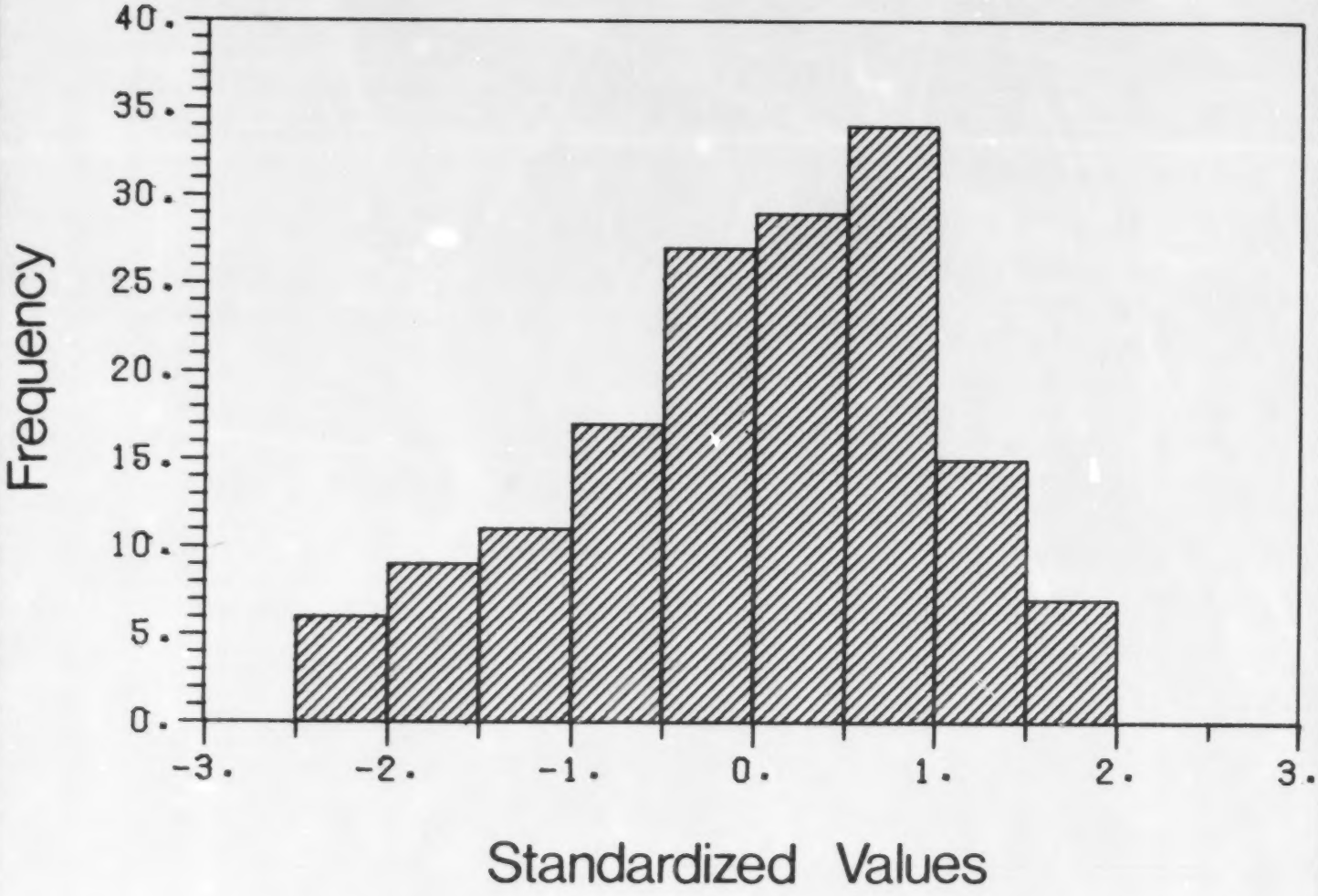

Figure 15. Teacher job satisfaction.